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OF THE

UNIVERSAL MEDICAL SCIENCES

A YEARLY REPORT OF THE PROGRESS OF THE GENERAL
SANITARY SCIENCES THROUGHOUT THE WORLD.

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DISEASES OF THE BRAIN.

BY LANDON CARTER GRAY, M.D.,

ASSISTED BY

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THE year has brought forth nothing original in this department. It has been rather a threshing over of old straw,—confirmations and amplifications of facts already known, rather than the discovery of new facts. But these verifications of knowledge are not without their value in many instances, as a perusal of the following pages will make evident.

CEREBRAL LOCALIZATION.

David Ferrier delivered the Croonian lectures last year, and took cerebral localization as his subject.^{June 7² to July 12} The discourses are well worthy of perusal, not so much because the well-read neurologist will find anything especially new in them, but because they fairly represent, with some few exceptions, the present condition of our knowledge regarding the functions of the brain. Ferrier's present views regarding the visual centres will undoubtedly be of interest, especially to those who are aware how great is the difference between himself and almost all other neurologists and experimenters of the present day. He believes that the occipito-angular region is the visual area of the cortex, and that destruction of it in one hemisphere causes permanent hemianopsia on the opposite side or paralysis of the corresponding halves of both retinae, while bilateral destruction causes complete and enduring blindness of both eyes. Apart from the loss of vision there are no other motor or sensory defects, the sensibility of the eyeball being intact and the ocular movements absolutely unimpaired. If the destruction, unilateral and bilateral, of the occipito-angular region is complete, neither the hemianopsia nor the blindness will be permanent. Ferrier is no believer in Munk's statement that

the angular gyrus is the centre sphere of the eyeball, maintaining that this view has been negatived not only by his own experiments, but by those of Horsley and Schafer; and that, furthermore, Munk has no data that he has recorded as indicating that losses of sensibility are in reality due to the loss of vision.

Ferrier rejects Seguin's view of the lesion of the cuneus producing hemianopsia, stating that in Seguin's case the fourth and fifth temporal gyri and a part of the gyrus hippocampi were also implicated, whilst cases (he affirms) have been recorded of unilateral and bilateral lesions in the occipital lobes without any visual affection whatever. This, however, is mere special pleading, which seems very weak in the face of the evidence that has been brought forward by Seguin's view. Ferrier has performed some recent experiments upon monkeys confirmatory of the view that the superior temporal gyri represent the sense of hearing in the cortex, and has collected 25 cases of word-deafness with the following results: in 10 there were lesions of the temporal lobe alone; in 7 of these the first temporal gyrus was particularly affected, whilst in 3 the exact limits were not stated. In 8 the lesions implicated the angular and upper temporal gyrus; in 6 the superior temporal gyrus and the adjoining portions of the occipital or temporal lobes were affected, and 1 was stated to have been due to lesion of the angular gyrus alone, there having been, in this latter case, word-deafness and word-blindness. In all these cases, therefore, except 1, there was a lesion of the superior temporal convolution. Ferrier still clings to his belief that the cortical sensory centres are not to be found in or around the motor area. He advances no new proof, however, beyond what his previous writings have contained, except an analysis of 284 cases affecting the Rolandic zone generally or in part. The difficulty with this analysis is the same as with all previous analyses of a like character,—the fact that most observers have been more preoccupied with observing defects of motility than sensory impairment. At all events, the collection of cases by Exner, Luciani, Seppilli, Dana, and others contain still greater proof to the contrary.

Welt,⁹⁸_{Apr.} as a result of careful studies upon 8 cases of injury or disease of the frontal lobes coming under his own observation, in all of which autopsies were made, concludes that changes in character and disposition, which very frequently occur after lesions

of the anterior lobe, are directly resultant from such injury or disease. These alterations of character and disposition frequently occur as the only symptoms, there being no motor or sensory disturbance. In all of the 8 autopsies, the convex cortical surface of the frontal lobe was the portion affected. In 3 of these cases the lesion involved the first convolution alone, in 3 others the first and third were involved, and in 2 the lesion extended from the first to the third and included the second. These results, together with facts accumulated from an analysis of autopsies in a large number of similar cases reported by others, showed that the location most uniformly affected was the region nearest the median line or the first frontal, and of the right rather than the left. The mental changes vary greatly as to the time of onset, nature, and duration. It will be seen that these conclusions are in accord with Ferrier's experiments upon this region in monkeys, and those of Goltz upon dogs, and Luciani upon pigeons and dogs. In another part of the ANNUAL will be found a synopsis of three cases reported by Thompson, of tumor located in the frontal regions, having an important bearing upon the functions of this portion of the brain.

A typical example of the physical and mental effects resulting from injury to the fore-brain is related in the history of an inmate of the Zurich Hospital.⁶_{Mar. 15} The man, while drunk, fell 100 feet, suffering a splinter fracture of both frontal bones, with contusion and efflux of brain-substance from the frontal regions. The man, who had before been peaceable, good-natured, cheerful, and cleanly, became malicious, slanderous, violently quarrelsome, and dirty. No other morbid changes were manifested.

Bearing upon the subject of visual localization, confirming the views of Seguin as to the relationship of the cuneus to homonymous hemianopsia, is a case reported by Delépine,¹⁰⁰¹_{May 20} in which right hemiopia was observed in connection with softening of the left cuneus. There were other patches of softening, however, in various parts of the brain, and one which had produced quite extensive destruction of the middle occipital convolution, rendering it almost valueless for purposes of exact deduction as to the cause of the hemiopia.

Mills⁴⁷_{Oct., '89} presents the following indications for surgical operation afforded by visual localization: "If the patient has lateral

homonymous hemianopsia as the special localizing symptom, operation should be performed with the object of reaching the cuneus behind the position of the parieto-occipital fissure. If without hemianopsia the patient fails in intelligent recognition of things and words (visual aphasia, so called), the aim should be the lateral occipital convolutions and the occipital gyri. When with lateral homonymous hemianopsia the patient also has hemianæsthesia, the lesion is probably in the tracts between the cuneus and the primary optic centres, large enough also to involve the sensory tracts. Such a lesion would probably best be reached beneath the position where, on the lateral aspect of the hemisphere, the parietal, occipital, and temporal lobes come together.

Bastian ⁴⁷_{v.10, '89} holds that in addition to the conscious impressions which accompany muscular action, and which he admits may be, chiefly at least, localized in the falciform lobe, there are a set of unfelt impressions which guide the motor activity of the brain, by automatically bringing it into relation with the different degrees of contraction of all the muscles which may be in a state of action. To these unfelt impressions he gives the name kinæsthesia, or sense of movement. The so-called motor centres are, therefore, according to him, in reality sensory centres, which excite the true motor centres of the spinal cord through the pyramidal tracts.

Ferrier does not concur with Bastian in including in the muscular sense, which is so essentially an act of conscious discrimination, the mere afferent or unconscious impressions, through the agency of which the harmonious co-ordination of the different segments of the spinal cord and lower centres is secured apart from the cerebral hemispheres; nor does he think that impressions which practically do not rise into conscience can be ideally revived or enter into composition of ideas or conceptions of movement. If it were the case, as Bastian assumes, that the ideal revival of kinæsthetic impressions is the immediate excitant of the true motor centres in the spinal cord, it would follow that the so-called motor centres would be independent centres of activity, irrespective of stimuli from the sensory centres of the cortex.

Exner and Paneth ²⁴⁶_{B.44, '89} have recently confirmed the original experiments of Marique, proving that a form of paralysis results by section of the fibres which associate the sensory centres with the motor centres of the cortex, of precisely the same character as

that which occurs when the motor centres themselves are actually destroyed.

APHASIA AND ALLIED STATES.

Motor Aphasia.—J. H. McBride²⁴²_{Aug.} reports a case of motor aphasia with right hemiplegia, the lesion (hæmorrhagic clot) being found at the autopsy to have involved principally the convolution of the island of Reil, and outside the claustrum. The hæmorrhage was in the white matter, and extended from the middle of the second frontal convolution along the entire extent of the island, slightly involving also the first temporal convolution. The hinder part of the third left frontal (Broca's) had been destroyed by the hæmorrhage.

Patterson²²_{July 2} reports a case of motor aphasia resulting from trauma to the base of the skull from a fall. There was also loss of power on the right side, with marked delusions. The patient made a perfect recovery within two months.

Picot⁷⁰_{Mar. 16; Apr. 13, 27; May 11} reports 2 cases of aphasia dependent upon tubercular meningitis. The first case was a typical example of simple motor aphasia, the lesions being in the meninges of the third left frontal convolution. The second case was of very much the same character, the aphasia being absolute, the meningeal lesion involving the island of Reil, the third frontal convolution not having been invaded by the purulent exudate at all. It covered completely the three radiating folds of the lobule of the insula and also the anfractuositities separating them. In front it was limited exactly at the anterior furrow separating the anterior fold from the anterior two-thirds of the third left frontal convolution; above, by the superior furrow separating the lobule of the insula from the region of the third frontal convolution (known under the name "cap de Broca"), as well as from the foot of the third frontal and of the frontal and ascending parietal convolutions. The exudate was thickest on the insula, becoming thinner toward the periphery, the white substance not being involved. The paper concludes with a summary of observations made upon aphasia due to lesions in this location, the author regarding such aphasias as being due to destructive lesions of subcortical fibres.

Souques⁷_{Dec. 6, '89} reports a case of right hemiplegia with pain and complete motor aphasia lasting more than four months. The autopsy showed an area of softening involving the posterior portion

of the third left frontal and the inferior extremity of the ascending frontal and parietal lobule. The softening was of embolic origin, depending upon disease of the mitral valve.

Bitot¹⁸⁸_{Dec. 15, '89} reports a case of aphasia (mixed) with right hemiplegia, the autopsy showing a meningo-encephalitis from cysticercus, affecting principally the anterior extremity of the sphenoidal lobe.

Tison⁷_{Nov., '89} records a case of motor aphasia with left hemiplegia in a woman aged 67, affected with mitral insufficiency, and who also had a sarcoma of the right ovary. The hemiplegia was complete, the limbs being flaccid and without contractures. Sensibility not affected. The aphasia was distinctly motor, the patient seeming to possess fair intelligence and understanding questions, but unable to respond to them except by gestures or by the word "yes." She could not repeat words from dictation. The right Sylvian artery was found to be atheromatous and blocked, at the autopsy, and the two bordering convolutions (presumably ascending frontal and parietal convolutions) extensively softened. The third left frontal convolution (Broca's) was found intact. It is not stated as to whether the patient was right- or left-handed.

Aphasia in Children.—Oliver²_{Feb. 8} describes 2 cases of hemiplegia accompanied by loss of speech in children. The first case was that of a child $2\frac{1}{2}$ years old who became suddenly affected with a right hemiplegia with complete motor aphasia, but without unconsciousness or convulsions at first. The child had learned to talk quite well previously, but was only able to make its wants understood after the paralysis by pointing with the finger. Death occurred on the twenty-fifth day, and at the autopsy there was found a vertical meningitis with effusion involving the left motor areas and Broca's convolution. The second case was one of left-sided hemiplegia with aphasia in a child $5\frac{1}{2}$ years old, who was not left-handed. The duration of the symptoms was altogether about ten weeks, the child recovering. The diagnosis was somewhat obscure as to the nature of the lesion, though the history indicated a traumatic origin and the case was possibly one of meningitis. During the illness the patient was almost completely aphasic, retaining a vocabulary of only one word (cake), understanding, however, what was said to her, except during occasional periods of delirium or unconsciousness.

Alexia.—Nieden has an advocate for the term “dysanagnosia,” which he originated, applying it to those aphasic conditions known as alexia or dyslexia, in Burnett,²⁴⁹_{Jan.} who gives the history of a unique example of this condition of word-blindness. The patient, an aged clergyman, after a rather severe vertiginous attack, with subsequently strong convulsive seizures, recovered from the resulting stupor without any loss of motor or sensory function, but with an absolute inability to interpret the meaning of printed or written words by means of a retinal perception. Sentences read to him were perfectly understood, were repeated accurately; his memory was unimpaired; he could even read numbers correctly, stating the amount of a check, though unable to tell to whom it was drawn or by whom written. He could write from dictation, and also, if not interrupted, originally. Individual letters of the alphabet were recognized without difficulty, with the noticeable peculiarity that the letter **S** provoked a disagreeable sensation whenever seen. No other defect of visual perception is mentioned. Pictures were readily understood and appreciated.

Adler³⁶_{Aug.} describes a case characterized by an inability to recognize letters by optical perception, although with written words or letters, by tracing their outline with his finger, he was able to identify them. The patient could write correctly and with ease from dictation and spontaneously. Objects held up before him were recognized, but were named with great difficulty, and sometimes the name of the object was only recalled by bringing some one of the other senses—touch, taste, muscular—to the assistance of visual perception. Amnesic color-blindness was also present, as well as right-sided hemianopsia; the lesion was in the subcortical optical fibres of the left occipital lobe, with an interruption of the connecting route between the right optical cortical field and the left centre of speech, where it passes in the left hemisphere near the commissural fibres connecting the two occipital lobes. Such is the hypothesis of the author, no autopsy having been made,—this opinion being based upon the results of post-mortem examinations in similar cases, which showed disturbances in the region of the left occipital lobe and angular gyrus.

C. Moeli⁴_{Apr. 28} describes two cases of word-blindness, with an autopsy upon one of them. The patient was admitted to the hospital complaining of subjective weakness, pains in the limbs, and

mental confusion, with defective memory. Motion, sensibility, knee-jerks, and pupillary reactions normal, though the papillæ were reddish gray and hazy. Seven months later a sharply-defined right hemianopsia was observed, and all the ocular muscles were found to be parietic. In testing the patient's vision it was found that he had considerable difficulty in naming well-known objects held up before him. Of a spoon he remarked, "I don't know its name, but I use it every day." When shown a razor, he would rub his cheek with his finger to indicate its use, though utterly unable to recall its name. The naming of colors held up before him was most difficult of all, though he could describe colors correctly from memory, mentioning, for instance, the word canary when asked to name a yellow bird, a raven for a black one, etc. For a time he could read and write fairly well, but afterward both became impossible. In counting, if four things were set up for him to count, he would touch four fingers, but perhaps utter a wrong number. He always understood perfectly what was said to him, and could give the words and continue the tunes of several popular melodies. There was weakness of the right arm; also of the facial muscles of the same side. Tactile, muscular, and temperature senses were all much impaired on the right side. The patient died of pneumonia, the autopsy revealing a large sarcoma in the left hemisphere, chiefly in the corpus callosum and extending into the posterior cerebral lobes, pushing the corpus callosum over toward the right side and slightly flattening the optic thalamus. It was about a centimetre distant from the base of the Sylvian fossa. A section through the posterior central convolution showed that the tumor was here over three centimetres in width, but opposite the anterior central convolution there was only a small growth in the gyrus fornicatus. The first temporal and third frontal convolutions were not affected.

The second case presented very much the same symptom group as that observed in case 1, except that there was a higher degree of motor aphasia present, and also a slight amnesic aphasia. In case No. 2 there was an inclination on the part of the patient to supply the visual defect by calling in the various other senses, particularly tactile and muscular sensation, as in Adler's case. E. J. Edwards, in an abstract review of Moeli's paper, ²⁵ June 29, quotes 5 similar cases collected by Freund, ³⁶⁸ of which cases Naunyn has

said that in a large proportion of all cases of undetermined aphasia the essential lesion is in the neighborhood of the transition of the angular gyrus into the posterior cerebral lobes.

Henschen³⁷²_{B.21, '89} reports 3 cases of word-blindness associated with apoplexy and hemiplegia, with autopsy. Amnesic and motor aphasia were also present in 2 of these cases. The angular gyrus was affected, as demonstrated at the autopsy, in the 2 cases which showed alexia and amnesic aphasia. In case 2, in whom a partial word-deafness had been also observed, the lesion involved part of the first temporal convolution and of the second also. Broca's convolution was most extensively involved in the case in which motor aphasia with the alexia had been observed, although quite an extensive area of the left hemisphere was included by the lesion.

Functional Aphasia.—Jacob,²_{Feb. 22} in a paper entitled "Functional Disturbances of Speech," describes 2 cases of aphemia in men, both completely cured by the inhalation of ether. In 1 case the speech disturbance came on gradually eight years previously. In the other case it occurred suddenly.

Strassman⁶⁹_{Mar. 6} relates a case of hysterical aphasia, combined with paralysis of the face, trismus, and spasm. The affection occurred suddenly, without any apparent cause, the boy having always been healthy. During the attack he could not speak or open his mouth, had dyspnoëic respiration, and the facial nerve was paralyzed. The symptoms all disappeared ten hours later as suddenly as they came. A case described as one of "Psychical (probably Neurotrophic) Motor Aphasia in a Child" has been reported during the past year⁹⁸_{July} which is worthy of mention, in that it represents an instance of mistaken diagnosis. The patient, a child 5½ years old, when asked a question replies after a muscular effort, such as pulling finger of opposite hand, or his clothing, or rubbing finger along the table, or starting out to walk and sliding his feet as he puts them on the floor, always starting with the right foot. He was asked, "What do you like to eat?" to which he answered (after pulling at clothing), "a—a—a—a—apples." He can sing and whistle familiar airs without embarrassment; can never say "I" properly or directly, *e.g.*, as a prelude he says, "Fi—fe—fo—I do," or "Of course," or "Yes, I do." He can answer, after some hesitancy like this, and violently pulling at

finger or clothing, or pushing finger along the table, or walking in a sliding manner over the floor.

The child was evidently of a neurotic temperament, emotional, often walking in his sleep, and the subject of night terrors. He never had a convulsion of any sort, even while teething, and has always been in excellent health. He was naturally a bright, quick-minded boy, a fluent talker for his age before becoming affected, using exceptionally choice language and forming good sentences. His hesitancy in speech was first noticed a year and a half ago. The mother states that about the time he first began to be affected the boy saw and often conversed with a milkman who was a great stutterer. The assumption by the author, from the above symptoms and from the fact that a motor effort seemed necessary to secure to the child the power of speech, is not sufficient evidence upon which to base a diagnosis of aphasia without serious detriment to the scientific significance of the term. The case was probably one of chorea, associated, as is frequently the case, with disturbance of a functional character of psychical activity.

Operative Cure of Aphasia.—Rosenberger, of Wurzburg,³³⁶
No. 25 reports an interesting case of aphasia with amimia (lost power of communicating thought by pantomime or gesture), the result of trauma over the left parietal bone from the kick of a horse. The boy was unconscious for twelve days following the injury, and after this time completely aphasic. At the time of his examination by Rosenberger, more than six weeks after the injury, the condition was as follows: The child, a boy 6 years of age, understood everything correctly, recognized everything, and could select what he wanted from any number of articles, but he was completely aphasic, and could not make himself understood by nodding or shaking his head, although, when shown how to do so, he could immediately imitate the movements. There was no fever, the pulse was normal, the appetite good, and the patient slept well. The eyes and ears were normal, and there was no paralysis, except of the fingers of the right hand, and this was slight. Over the left parietal bone there were three ulcers, the undermost of which was 2 centimetres over the left ear. It was about 3 centimetres long, equally wide, bulged out, and showing distinct cerebral pulsation. The cranial vault was depressed about the ulcers.

Rosenberger removed the depressed portions of bone, covering the corresponding defect with two flaps, after the plastic method of von Bergmann; the result was brilliantly successful. Paralysis of the hand disappeared rapidly, and on the sixth day he uttered a sound like the letter I. He was discharged with complete restoration of speech on the twenty-second day.

Another case of successful operative interference for the relief of an aphasic condition is reported by Glynn.^{187 Jan.} The case is one of unusual interest. The patient, a man aged 55, was the subject of hemianopsia and that form of aphasia known as word-blindness, the result of an injury to the skull received four months previously. Examination of the point of injury showed a distinct depression of the skull at the posterior extremity of the sagittal suture, about 1 inch above its termination in the lambdoidal suture. The depression was about 3 inches long and over 1 inch wide; it crossed the sagittal suture at right angles and was deepest on the right side. The appearance of the cortex, the depressed bone having been removed, indicated that the upper portions of the right and left cuneus had been the points of injury. This view is supported by the symptoms of defective vision in concentric restriction and homonymous hemianopsia.

Among the evidences of aphasia was an absolute inability to read, and, though he evidently saw the face of the clock, he was unable to tell the time. He had forgotten, also, the use of the commonest objects about him, and the names of his tools and their use. He was a saddler, and on trying to sew a piece of leather he would go hopelessly wrong, but would not know that he was blundering, and refused to be corrected. His memory was very defective. He could name any article shown to him, but had, occasionally, some little time to consider before doing so. He understood everything said to him, and could write fairly well in a straggling manner, but was utterly unable to read what he had written, even failing to recognize his name and address after he had written it himself. When asked to pick out letters from loose type spread before him, he, as a rule, failed to do so, though he sometimes named a letter when he took it up and studied it carefully, being assisted in acquiring a correct notion of the character of the letter by moving the tip of the finger over it. This was accomplished, evidently, by means of the muscular sense observed

in similar cases by Westphal, Charcot, Ross, and others. The patient had no motor or sensory disturbance except, perhaps, a slight hyperæsthesia of the hands and feet. The reflexes were all present, the knee-joints and plantar reflexes being somewhat exaggerated. The result of the operation of trephining was markedly beneficial, although the patient disappeared from observation before any extended observations had been made. The points of special interest in the case consisted in the limitation of the aphasic defect to the recognition of printed and written words or word-symbols; the ability to acquire a correct idea of the character of a letter through the muscular sense; the relation of the symptoms of hemianopsia and word-blindness to the location of the lesion, involving, as it did, certainly the occipital lobe, and perhaps the cuneus, is of value from the stand-point of localization, and is confirmatory of the views of Nothnagel as to the function of this region.

Astasia-Abasia.—Eulenburg, ⁷⁵_{Dec. 1} in a paper upon this subject, observes that the term “astasia-abasia,” which has been applied to a symptom which consists in an inability to stand or walk upright, although the muscular strength, the co-ordination, and the sensibility of the lower extremities may be perfect, is seen under widely different conditions and described under very different names. For example, when accompanied by pain it has been called *dystasia-dysbasia*. Eulenburg reports a case of this condition occurring in a girl aged 18, who showed vague nervous symptoms, finally developing typical exophthalmic goitre, with anæmia and cardiac dilatation. She improved under treatment for goitre, but when much better she complained of paralysis in both legs; as soon as she attempted to walk or stand the legs became quite helpless, and there was pain in them, especially in the calves. Upon examination it was found that she could walk or stand, but the other leg movements, when the patient was lying down, were perfectly normal. She had no other symptoms, and was completely cured by means of a strong electric current. Eulenburg considered her case as due to a kind of auto-suggestion.

Möbius, ¹³_{July 15} contributes an elaborate paper upon the subject, with an analytical review of an extensive literature and many reported cases. Ladame, ⁹⁴_{Jan.} reports a case of this malady.

CEREBRAL LESIONS.

Lesions from Ear Disease.—G. Newton Pitt,²_{MAR.22} in the first of the Goulstonian lectures for 1890 upon the subject of cerebral lesions, gives an interesting analysis of 57 fatal cases of ear disease affecting the contents of the cranial cavity. Nearly all the cases occurred in patients under 30 years of age, only 9 being over 30. Four were babies less than 3 years old. As an illustration of the difficulties attending a diagnosis in ear disease associated with brain symptoms, he mentions the fact that in more than one-sixth of this series the patient died without any otorrhœa having been noticed. In all the cases in which pyæmia occurred, the onset was preceded by thrombosis of the lateral sinus. Death was caused in all but 2 of these cases by intra-cranial complications,—among them abscess, mastoid suppuration, meningitis, and sinus thrombosis. Of the abscess cases 3 were in the cerebellum, 1 in the pons, 2 in the centrum ovale, and the remaining 12 in the temporo-sphenoidal lobes. In only 2 of the abscess cases was there any fever due to the abscess. The temperature was rarely high, with uncomplicated cerebral abscess; 2° above the normal in 6 cases. In 8 it was high; 3 of these had meningitis, 2 thrombosis of the lateral sinus. The author reaches the following conclusions:—

First: Abscess in the temporo-sphenoidal lobe, which is by far the most common situation, is often associated with an inflamed or sloughing dura mater over the anterior surface of the petrous bone or pus beneath it. Other complications are infrequent except meningitis, generally due to extension or rupture of the abscess. The abscesses are almost always very close to the roof of the tympanum. Imperfect drainage of the (middle) ear is frequently, if not invariably, the origin of the mischief. Mastoid suppuration often affects the posterior surface of the petrous bone, but it may be associated with disease limited to the middle fossa of the skull. Cerebral abscess only occurs when the otorrhœa has lasted for months or years. The symptoms usually come on insidiously. Rigors, pyrexia, and optic neuritis are all infrequent in uncomplicated cases, but all occur occasionally. A headache of intense severity and a dull, sluggish mental state are the two most characteristic symptoms. Cerebellar abscesses are less common, and will probably be associated with disease of the dura mater behind the petrous bone, or with thrombosis of the sinus.

With regard to thrombosis of the lateral sinus, occurring as a complication of ear disease, it is stated to have occurred 22 times. In some of the cases there was well-marked phlebitis, but not in all. The thrombus was suppurating in more than half. The thrombosis developed in some of the cases directly from inflammation or necrosis of the petrous bone, the dura being inflamed or sloughed over it. In 3 cases there was a collection of pus outside. In other cases infection had spread from disease on the mastoid cells or of the posterior wall of the tympanum by means of the conveyance which emptied into the sinus, the dura mater not having been infected. The thrombus giving rise to sinus thrombosis is generally of some standing, but not always. The chief symptoms, nearly always, of sudden onset are pyrexia, rigors, pain in the occipital region and in the neck, associated with septicæmic condition; well-marked optic neuritis may be present. The appearance of acute pulmonary mischief is almost conclusive of thrombosis. The average duration is about three weeks, and death is generally from pyæmia.

Cerebral Embolism.—G. Newton Pitt,²_{Apr. 12} in the third of the Goulstonian lectures for 1890 on cerebral lesions, gives a summary of the facts observed in 79 cases of cerebral embolism occurring during a period of twenty years at Guy's Hospital. In most cases there was no difficulty in tracing the source of the embolus. In only 6 cases was the source not discovered. The mitral valve was the most common seat, 46 cases showing this lesion. In 7 of these 46 cases the aortic valve was also diseased. In 68 cases the source of the embolus was found to be in the heart. In four-fifths of these 68 cases there existed a fungating endocarditis. The heart disease was usually due to rheumatism originally, but the cause of the acute fungating disease was, as is generally the case, obscure. Gonorrhœa was cited as the starting-point of the whole disease in 2 cases. A prostatic abscess was held responsible in another case. In 2 cases the hearts were hypertrophied and dilated, in association with a chronic Bright's disease and bronchitis, respectively.

As regards the location of the emboli, in 75 per cent. of the cases analyzed they were found in the middle cerebral vessels, the two sides being affected with equal frequency. In about one-half the cases, middle cerebral was the vessel occluded, the internal

carotid being next. In 20 cases the emboli could not be found, although in every one there was evidence unmistakable that patches of softening or the aneurisms were embolic. It is worthy of notice that in one-fifth of the cases of embolism occurring in the middle cerebral arteries there were no cerebral symptoms to indicate the onset of the plugging. It is also worthy of attention that the cause of death is said to have been due to the cerebral lesion in only 40 per cent. of the patients. Heart-failure and the septicæmic condition induced by the fungating endocarditis, pulmonary disease, or other complications more frequently causing death than cerebral lesion itself. Of 9 cases, however, in which emboli occurred in both middle cerebral arteries, all the patients died from the cerebral condition.

The analysis does not demonstrate anything new in the symptomatology of embolic lesions, except, perhaps, of a negative character. It was noted that embolism often gave rise to no symptoms at all, and also that the symptoms were not definitely associated with the amount of softening visible. Occlusion of the internal carotid was almost invariably followed by hemiplegia, and in some cases there was a well-marked recurrent blush on the face for a few days. Only twice in the whole series of cases was optic neuritis observed. In 1 case ecchymosis and gangrene of the ears first occurred.

Cerebral Aneurism.—In 9,000 post-mortem inspections made at Guy's Hospital during a period of twenty years, cerebral aneurism was found only 19 times; that is, in less than $\frac{1}{4}$ per cent., according to the statement of G. Newton Pitt.²_{Apr.12} These 19 cases, with 4 others in which a probable demonstration of aneurism was made, form the basis of an analysis by Pitt, which leads to the following conclusions:—

The lesion is very rare. It is most exceptional to find a cerebral aneurism which is not associated with fungating endocarditis. The lodging of a septic embolus is the starting-point of the changes which take place in the vessel. The clot inflames and, in most cases, disappears, the vessel dilating from the inflammatory changes in its coats. An aneurism may form in three weeks. The onset of the embolism may not be marked by any symptoms, and the rupture of the aneurism may be the first indication that there is danger. They are usually on the surface of the brain, and when

they rupture are more rapidly felt than any other forms of cerebral hæmorrhage. As the aneurism increases in strength its contents spread inward, plowing up the cerebral tissue and rupturing into the lateral ventricle, perhaps, although it has originated on or near the surface. Cases of cerebral hæmorrhage in young people will generally be found to have originated in aneurism.

Hale White⁶_{Nov. 23, '89} has observed an instance of that rare lesion, symmetrical intra-cranial aneurism of the vertebral arteries. The post-mortem examination showed emboli to have caused the aneurisms, the emboli originating in an ulcerative endocarditis. The symptoms were identical in character with those of cerebro-spinal meningitis, with well-marked optic neuritis.

Christian A. Herter describes a very interesting pathological condition in the presence of a dissecting aneurism in a large branch of the left middle cerebral artery, which was found in the case of a patient who had survived two attacks of hemiplegia. The clot between the elastic layer and the media had completely occluded the vessel. There were areas of multiple softening, and a wide-spread endarteritis of the medium and small arteries of brain.

Cerebral Hæmorrhage.—In a paper entitled “Forms of Cerebral Hæmorrhage,” Dana⁵⁹_{Aug. 16} divides intra-cranial hæmorrhages into three types, according to the occurrence of hæmorrhages from the three sets of intra-cranial blood-vessels. These three types he designates the dural or pachy-meningeal, the pial or subarachnoid, and the central (including cerebellar and pons hæmorrhages). As a result of extended clinical observations, with autopsies, Dana deduces the following conclusions:—

Of the three forms of hæmorrhages mentioned—dural, cortical, and ganglionic—the first is most apt to occur in women, in the insane, and in alcoholic subjects between the ages of 35 and 50 years. The main symptoms are headache, delirium followed by stupor and coma, localized convulsions, and often some paralysis. Cortical hæmorrhage is distinguished, when it causes any symptoms at all, by a stricter limitation of the convulsions and the paresis. The ingravescent form of central hæmorrhage is also most frequent among women, and the location is most common upon the right side. The symptoms are pain, vertigo, vomiting, retention of consciousness at first, hemiplegia and anæsthesia, the symptoms being progressive and surely becoming fatal.

In the cases thus far reported the lesion has been in the external capsule between the lenticular nucleus and the cortex. Alcohol, insanity, and trauma are etiologically related to cortical and dural hæmorrhages, while syphilis, chronic Bright's disease, and cardiac hypertrophy affect principally the basal and central vessels.

As regards the type known as ingravescent or progressive apoplexy, the author rather inclines to the trephine as a means of possible relief. This must be done before the blood breaks into the ventricles. To reach a hæmorrhage in these cases the best place to trephine, Dana suggests, would be a little below and in front of the parietal eminence. To reach the internal capsule in its anterior and middle parts he recommends that a point be located midway between the anterior and posterior ends of the corpus striatum and optic thalamus, respectively,—a procedure provided for in rule 10 in the author's rules for cranio-cerebral topography.⁵⁹
Jan. 12, '89

Heidenhain,⁴_{Feb. 10} in a clinical lecture upon the subject of "First Treatment in Apoplexy," calls attention to the necessity which exists for a change in the accepted teachings upon this subject. After relating several instances within his own experience, in which the usual custom of placing the patient suffering from cerebral hæmorrhage in the recumbent posture had been followed immediately by an increase in the gravity of the symptoms, he outlines the following plan of rational treatment:—

Place the patient in the sitting-erect position and maintain such position as long as possible, apply ice to the head and hot water to the feet, administer an energetic purgative, and, in appropriate cases, apply leeches at any appropriate and convenient point about the cerebral vessels.

Ligation of the extremities by the application of Esmarch's elastic bandage, so effective in the treatment of profound syncope, might be also successful, Heidenhain suggests, in cerebral hæmorrhage, the reverse condition.

Bastian, in a lecture upon the same subject,⁶_{Mar. 8} advises a plan of treatment which is somewhat at variance with the above. The extreme difficulty surrounding a differential diagnosis between hæmorrhage on the one hand and embolism or thrombosis on the other—conditions requiring directly opposite methods of treatment—leads him to advocate a course of procedure which is almost

negative. In cases of thrombosis or embolism, in order to diminish the effects of obstruction everything should be done which would tend to promote the collateral circulation. Digitalis with ether or aromatic spirits of ammonia is indicated to strengthen the heart's action. If hæmorrhage is present this treatment would be the most harmful possible, for in such a case the action of the heart should be depressed and the tension within the vessels diminished. In hæmorrhage the patient should be put in a recumbent position in a cool room, the head and shoulders being well raised, and, if there is much heat or throbbing about the head, cold applications or an ice-bag should be applied and the legs and feet wrapped up with flannel in contact with hot bottles. If the face is flushed, 20 grains of bromide of potassium (1.3 grammes) and 4 or 5 (dangerous dose) minims (0.25 to 0.33 gramme) of tincture of aconite should be given to quiet the circulation. In other words, the treatment, if the case be treated actively at all, depends upon the character of the cause.

Crus Lesions.—Sachs⁹⁹_{July 24} made a diagnosis of a lesion in the right crus, the symptoms being left hemiplegia, double ptosis, and other ocular symptoms, with a peculiar symptom in wild ataxic movements of the left upper extremity occurring paroxysmally. The patient was demented and emotionally excitable; the diagnosis was confirmed by the autopsy.

Cerebellar Lesions.—A demented asylum patient, insane for years, was suddenly attacked one morning with vomiting and extreme dizziness, followed by rapid paralysis of the left side, with paresis of the right side, forced rotation of the body to the right, and a nystagmus coma and death in twenty-four hours, the result, as proven at the autopsy made by Bannister,²⁴²_{Sept.} of capillary hæmorrhage involving the ventral portion of the anterior cerebellar peduncle.

Marsh²_{Jan.} gives the history of a case (still under treatment) of trauma to the vortex, producing symptoms which indicated a lesion of the middle lobe of the cerebellum. In addition to the usual symptoms pointing to this region, there were convulsive seizures characterized by "a running backward for several steps" before the patient would fall unconscious.

Lesions of the Optic Thalamus.—Multiple hæmorrhages into the optic thalami were found at the autopsy of a patient of Allen

Sym.³⁶_{Nov.} Although the patient lived ten days after the occurrence of hæmorrhage, the only symptoms which are said to have been observed were "jerkings and stiffening of the limbs, vomiting, varying pulse and respiration, and slightly elevated temperature." No mention is made of any examination as to sensory and motor disturbances, nor was the ophthalmoscope used.

A case of aneurism of the anterior cerebral artery, occurring in a young man 19 years old, not associated with embolism, is reported²_{July 5}—the symptoms, giddiness, pains in the head, and vomiting, dating from a fall two years previously. Death, which was preceded by convulsions and right hemiplegia, was caused by rupture of the aneurism. A clot was found in the left frontal lobe, extending back into the optic thalamus.

Pons Lesions.—Russell and Taylor⁴⁷_{Jan.} give the details of a case with autopsy, of hæmorrhage in and about the pons. The duration of the symptoms had been more than two years. There was first a right hemiplegia, passing off in a few days. Two subsequent seizures, characterized by extreme giddiness and temporary aphasia, but without unconsciousness, left the patient with a general weakness in all four extremities, most marked on the right side, the tongue not being affected. A few weeks before death there supervened almost complete paralysis of the left arm and leg. The right limbs remained as before; both sides of the face were affected, but the right more than the left; tongue pointing to the left; articulation becoming very indistinct; difficulty in swallowing ensuing, and death in coma, with high temperature. There was no ocular paralysis, or optic neuritis, or convulsions. There was no lesion in the motor pathway above the pons. The hæmorrhages in the pons were in such positions as to affect tracts on both sides, one being in the right middle peduncle, another in the medulla at the level of the decussation. The dorsal and ventral pons fibres were involved, although no clinical observations would seem to have been made regarding the sensory symptoms.

Rorie⁵_{July} and Wallace⁶_{Apr. 5} also report cases of death from pons hæmorrhages, but the fatal result occurring with much greater rapidity. In Rorie's case, in which the hæmorrhage broke into the fourth ventricle and overflowed from it into the lateral ventricles, the patient died in two hours. In Wallace's case, the blood also forced its way into the fourth and lateral ventricles, the patient

dying in four hours and a half and the temperature rising to 109° F. (42.8° C.).

Shattuck⁹⁹_{Oct} reports a case of hæmorrhage into the pia of the medulla and pons, and also into the white matter of the right hemisphere, behind the fissure of Rolando, which was continued into the right lateral ventricle and into the third and fourth ventricles, which presented no symptoms during life except headache and weakness in the limbs, as manifested by easy fatigue. The patient was 14 years of age, and had been blind since the age of 4, the loss of vision resulting from a sun-stroke. There was a history of convulsions in infancy.

Foreign Bodies in the Brain.—Wilkins²_{Mar.} relates the case of a patient admitted to the London Hospital suffering from Bright's disease, which caused his death, whose skull was found to contain, at the post-mortem examination, a portion of a knife-blade $\frac{3}{4}$ inch in length, evidence existing to show that the foreign body had been present for a number of years, although there had never been any symptoms of cerebral irritation or injury. The knife-blade was found impacted in the left temporal bone, passing down into the fissure between the middle and inferior frontal convolutions, to which its plane was parallel. There was no injury to the cerebral tissue, but the dura mater was thickened around the sight of puncture. The point of entry in the outer table of the skull was covered with very old scar-tissue. Two other cases of a somewhat similar character have also been reported during the year.²²_{Aug.13} In 1 of these a knife-point, $1\frac{1}{2}$ inches long, was found projecting from the inner table of the skull into the brain, having been borne without inconvenience for a long time. In another case four 3-inch nails were driven into his own brain by an insane patient, the man recovering. While it is true that in many instances foreign bodies of considerable size and weight have penetrated the brain, remaining imbedded for months, or even years, without causing any very serious symptoms, this is decidedly not the rule. Operative treatment is, without an exception, indicated where penetration of the cranial walls by a foreign body is known or even suspected.

BRAIN-ABSCESS.

During the year there have been presented quite a number of successful operations in cerebral abscess. A most striking and in-

teresting illustration of the difficulty that is occasionally found in ascertaining the cause of a cerebral abscess is found in a case related by Grawitz.²²⁶
B.39,H.2,'89 A patient died of basilar meningitis. Post-mortem investigation showed purulent infiltration of the pia in the left middle fossa of the skull. This collection was quite circumscribed, and there was no connection demonstrable with the ear, which was free from disease. A tract of suppuration led, however, to the left cavernous sinus, which was found, when opened, full of pus. So far no light had been thrown upon the origin of the trouble, but further examination showed a very noticeable infiltration of pus in the sheath of the trigeminal nerve, which extended farthest in the periphery of the superior maxillary branch. This seemed, from the post-mortem appearances, to have been the avenue of introduction, and the supposition was apparently confirmed by the hospital records, which showed that three weeks previously the patient had suffered from a boil on the face exactly over the foramen of exit of the left infra-orbital nerve.

Phelps¹_{Mar.29} reports a case with central abscess occurring as a result of trauma, with no topographical connection whatever between the site of trauma and the abscess. L. B. Gillette⁷²_{Dec., '89} describes a case which he diagnosed as cerebral abscess, the patient recovering through the spontaneous evacuation of the pus *via* the naso-pharynx. The patient, a man aged 20, was struck early in September, by the handle of a wheel-scraper, quite forcibly under the chin, knocked down a 16-foot embankment, and remained unconscious twenty or thirty minutes. He returned to his work in an hour or two, and had no further symptoms for a week, when he noticed a diplopia, especially of the right eye, vision being less distinct also in this eye. About a month after the receipt of injury he began to suffer from headaches and nervousness, and a day or two later, after getting wet, he had a chill. Upon examination the patient was found suffering with an intense headache, which was generalized; the pupils were widely dilated, the right pupil not responding to light at all, the left only slightly. There was photophobia, and the patient was very irritable. Temperature 101°, pulse 105. Within the next three days symptoms of marked compression developed. Temperature went down to 96°, pulse as low as 42, and respiration 9 to 10. There was complete right and partial hemiplegia, complete loss of sensibility and consciousness,

with indifference to light and sound. The patient remained in this condition three days, with no perceptible change. On the fourth or fifth day of coma a violent fit of coughing occurred, and the patient spat out about an ounce of green, stinking pus, with an immediate return of consciousness and steady improvement thereafter. Permanent damage had been done, however, and nine months after there was present total blindness in both eyes, deafness of right ear, weakness of right arm, and mental deficiency.

The possibility of spontaneous evacuation of pus in brain-abscesses may be always considered in giving a prognosis, though the extreme improbability of its occurrence should never be forgotten, and it should never be allowed the slightest weight of influence against surgical interference. Surgical operation is practically the only hope, and the records of the year prove excellently well its great value. Among the large number of successful operations reported are 2 by Arbuthnot Lane, ² June 7; 1 each by Schmidt, ⁸⁴ June 28; Milligan, ² Dec. 21, '89; Thompson, ² July 26; Graham and Grube, ⁶⁵ Oct.; Picque, ³⁷ July; and Politzer. ³⁴ July 22. Other cases reported in which either operation failed or was not attempted are by Vistoria Fornora, ⁵⁸⁹ Oct. 27, '88; Chaix, ²¹¹ June 1; McPhedran, ¹³⁹ Dec. 16, '89; and Hoffmann. ³⁴ Mar. 27.

Lloyd ² May 11 relates the history of a patient who was operated upon for cerebral abscess in 1887, and who recovered from the operation, remaining well for two years, dying, however, quite suddenly, the autopsy showing a re-accumulation of new pus in the same locality as before (temporo-sphenoidal lobe).

Otto Korner ³²⁸ v. 28 gives some interesting statistics upon the subject of cerebral abscess following disease of the ear, based on 100 cases which he had personally observed. Of these, 91 were examined after death, and in 9 the abscess was opened during life. He finds that the frequency of such abscesses in the cerebrum is nearly twice as great as in the cerebellum, and that in children below 10 years of age their frequency is three times that of adults. The explanation of this difference is held to be the greater distance of the tympanum from the cerebellum in children. The liability of males is twice that of females, and the generally-admitted fact of the disease being more common on the right than on the left side is borne out by the statistics. As regards the extension to the brain from the diseased temporal bone, Korner finds (1) the cerebral abscess most often occurs where the dura is implicated, in

cases of disease of the petrous, or mastoid; (2) the dura and brain-substance between the diseased bone and the abscess are generally diseased; in only 6 out of 90 cases was the intermediate brain-substance normal. He thinks that more careful observation may show more cases of direct extension of the suppuration from the diseased bone than is now thought to be the case. The abscess is nearly always in the temporo-sphenoidal lobe or in the lateral lobe of the cerebellum in the vicinity of the diseased ear. The few exceptions which he met with were, he thinks, possibly examples of metastasis or of generalized tubercle. As a rule, the abscess is solitary; in 6 of his cases it occurred in the temporo-sphenoidal lobe, as well as in the cerebellum; but in 4 out of 32 cerebellar cases, and in 5 out of 62 cerebral, there was more than one abscess in close contiguity. The most frequent complication was thrombosis of the lateral sinus. Purulent meningitis, in some cases by extension from the bone disease, in others from rupture of the abscess, occurred 17 times. In 3 cases the abscess burst into the lateral ventricle and in 1 case into the fourth ventricle. In 1 case death was preceded by bursting of the cerebellar abscess into the ear. Disease of the middle ear and mastoid is more likely to lead to temporo-sphenoidal abscess, of the labyrinth to cerebellar abscess. This fact may aid in localizing the seat of the abscess, for diagnosis is not much aided by the seat of pain, and but little by that of tenderness on percussion. Vertigo and optic neuritis may occur in either form, but disorder of speech, with hemiplegia and hemiparesis, may point to implication of the cerebrum rather than of the cerebellum. Two cerebral cases exhibited crossed facial paralysis, which, however also occurred in 1 case of cerebellar abscess.

TUMORS OF THE BRAIN.

Pathogenesis.—The subjects of etiology and pathogenesis of intra-cranial growths have attracted no little attention during the past year, and a number of elaborate studies have been made with a view to the elucidation of disputed points. Lannelongue⁷⁷⁹_{Jan., Feb.} has made an exhaustive investigation of the origin of intra-cranial dermoid cysts, and crystallizes his results in the following law: Every dermoid cyst arises from the closure or the persistence of the ectoderm issuing from an embryonic fissure. Connolly Norman¹⁶⁶_{July} contributes a paper upon the pathology of certain brain-tumors,

particularly that type known as endothelioma; the same, according to the author's opinion, as that described by Gowers under the name "nested sarcoma." Cysticercus of the brain is the subject of a paper, bearing particularly upon the pathology, by Bitot and Sabrazès.⁵⁵ July 12, 21, 26; Aug. 16, 23. Two cases of this affection are also reported in a joint paper by Nabias and Dubrenilh.¹⁸⁸ Dec. 22, '89

Tumors of the Frontal Lobes.—Griffith and Sheldon¹⁶⁶ p. 223 report a case of tumor of the frontal lobes having some negative bearing upon localization. The tumor, "having in shape and size a resemblance to a second cerebellum," was found "thrust into and between the frontal lobes—divided itself into two lobes by the crista galli—each of which occupied almost the whole of the orbital aspect of the overlying frontal lobes, whose interior white matter it had largely excavated. The left segment of the tumor was the larger, and on this side it just reached without involving the anterior limit of the corpus striatum. The symptoms were occipital pain, typical vomiting, occasional nocturnal delirium, dullness of vision and hearing (right ear), followed by double optic neuritis, paresis of right abducens and right olfactory nerves, loss of taste, with lost knee-jerks, right hemianæsthesia and left hemiparesis. The most noticeable feature of the case was the almost complete absence of mental symptoms, a slightly hysterical condition in the early history of the case, with, later, some slight defect of memory, having been all that was observed, the patient remaining thoroughly conscious and coherent up to within a few hours of death. The absence of any decided mental involvement in this case, with such an extensive and gross lesion, is confirmatory negatively of physiological experiments and previous clinical observations to the effect that it is the cortex of the convexity, and not the base of the frontal lobes, which is the seat of mentality and psychical individuality.

Putnam⁹⁹ Apr. 10 reports 3 cases of cerebral tumor with autopsies, one of which is particularly interesting as an example of how much there is yet of uncertainty in localizing symptoms with the object of affording surgical relief. The case presented the following symptoms: Short attacks of arrest of power of speech for short periods without complete loss of consciousness or of power of expression in writing, or of comprehension of simple speech or written signs, but preceded by trifling tremor of right hand; per-

manent slight hesitancy of speech, with paraphasia (slight); occasional general convulsions, without aura; frontal or occipital headaches; mental failure; finally, repeated attacks of slight convulsive action of flexors of right hand, with tendency to contraction; paresis of extensors. At the operation (done by H. H. A. Beach), the suspected tumor was not found at the point indicated by the symptoms (just above motor speech-area, Broca's convolution), but as revealed at the autopsy in the supra-marginal gyrus at its posterior end $\frac{3}{4}$ inch from the posterior limit of the post-central or Rolandic convolution, and far from the motor speech-centre. Another of Putnam's cases is interesting from the fact that the optic neuritis was far greater on the side of the lesion than opposite, the tumor being found in the posterior half of the right middle frontal convolution. This is exactly contrary to the teachings heretofore generally accepted, and is added evidence of the well-known fact that optic neuritis *per se* has no localizing value whatever in brain-lesion.

Three cases of tumor of the frontal lobes, almost identical in location, as demonstrated at the autopsy, have fallen under the observation of W. Gillman Thomson ⁹_{May 31} within the past two years, constituting an experience which is, at least, unique. Two of the cases were syphilitic, as demonstrated at the autopsy, although there was absolutely nothing in the history or physical condition of either patient to indicate a specific infection during life. The third case was sarcoma, secondary to sarcoma of the neck. There were no localizing symptoms except changes in temperament and alterations in the intellectual sphere in either of the 3 cases, but the mental symptoms were marked and characteristic in all. In all 3 cases the convexity of the frontal gray matter was involved, and not the base or orbital surface.

Tumors of the Optic Thalamus.—Edes ⁵⁹_{May 24} gives a detailed history of a case in which post-mortem examination revealed a tumor of a glio-sarcomatous character, involving nearly the whole of the left optic thalamus, and possibly also the posterior portion of the hind-limb of the internal capsule, with no optic neuritis observed during life, and no disturbance of vision whatever other than occasional transient diplopia. There was decided hemianæsthesia alternating with hyperæsthesia, which the author attributed to the involvement by pressure of the hind-limb of the internal

capsule. The paper contains a brief *résumé* of 9 cases reported by different observers with similar lesions.

"Tumor of the Thalamus, more especially of the Pulvinar, Presenting Wernicke's Pupil Reaction" is the title of a recent paper by F. X. Dercum.²⁴²_{Aug.} The tumor (gliosarcoma) was found in the left thalamus, chiefly in the pulvinar, though involving also the tubercle, and to a much less extent the adjacent part of the caudate nucleus. There was some evidence of pressure upon the posterior third of the internal capsule. The patient showed distinctly-defined right lateral hemianopsia, much more pronounced on the left; progressively-developing blindness, though no optic neuritis; motor and sensory impairment of the right side, deepening into hemiplegia and hemianæsthesia, both of which were complete; marked athetoid movements of the right arm, which, with the Wernicke pupillary reaction, afforded data for diagnosis as to the location of the lesion.

Tumors of the Corpora Quadrigemina.—Sachs¹_{July 12} reports a case of tumor in this region, in which the symptoms corresponded exactly to the diagnostic requirements of Nothnagel (ataxia, paralysis of ocular muscles in various degrees of intensity, and hydrocephalus). The value of this case is, however, much diminished by the fact that the neoplasms (tubercles) were multiple, involving the cerebellum, the segmental division of the crus, and the interpeduncular space. The quadrigeminal bodies had been almost entirely destroyed, and represented, perhaps, the most active focus of the disease. The symptoms first noticed were mental dullness, staggering gait, and ptosis. All the ocular muscles became finally completely paralyzed with the exception of the interni, which retained slight movement, the ciliary and the sphincter irides.

Thistle and Caven¹³⁹_{June 16} report the case of a boy aged 10, in which a diagnosis of a tumor pressing on the cerebellum, and in all probability involving also the corpora quadrigemina, was quite accurately confirmed by the autopsy. The growth, as large as a hen's egg, lay upon the crura cerebri in front of the middle lobe of the cerebellum, behind the third ventricle, partly covered by the velum interpositum. The corpora quadrigemina and pineal gland had been completely destroyed. The middle lobe of the cerebellum was damaged, and perhaps the lateral lobes also. The growth proved to be an alveolar sarcoma. The localizing symptoms were

staggering gait, swaying when standing and finally falling backward; tonic spasm, and ocular muscle paralysis, with nystagmus and blindness of quick onset.

Tumors of the Corpus Callosum.—Berkley^{5 June} makes a valuable contribution to this subject in an analytical paper upon tumors of the corpus callosum, with a report of a case of his own observation. He prefaces his paper with a review of the literature of the subject, having been able to collect 12 cases from all sources. An analysis of these 12 gives the following symptoms: headaches in 6, vomiting in 1, epileptiform attacks in 1, optic neuritis in 6 (of which 2 are doubtful), disturbance of intelligence (usually in the form of dementia) in all, hemipareses in 6, parapareses in 3, and muscular stiffness in 2. The one constant symptom was mental disturbance, while headaches, as in other brain-tumors, were quite common. In Berkley's case the only symptom indicative of the presence of any brain affection was a monomania, with the single delusion of great inventions and discoveries of all sorts of impossible mechanical contrivances. The patient died of pulmonary œdema, and the tumor of the corpus callosum was an accidental post-mortem revelation.

Two other examples of tumor in this locality may be added to the 12 collected by Berkley: 1 by Lutzenberger^{75 No. 3} and 1 from the records of St. Thomas's Hospital.^{418 v. 13} The latter case was admitted to St. Thomas's Hospital with a history of good health until within two weeks of his entrance to the hospital, where he remained under observation only one week, dying on the eighth day. At the time of his admission he was suffering from fits, which began the night before and continued at intervals for twenty-four hours, the patient having as many as three in an hour. In the intervals there was right hemiplegia, with pupils equally contracted and inactive to light, the right one afterward becoming larger than the left. After the convulsions ceased the patient remained in a state of mental hebetude, but spoke when questioned, though indistinctly and with a stammer; understanding questions, however, invariably. He died of respiratory failure, the autopsy revealing a soft, very vascular new growth, occupying the anterior third or fourth of the corpus callosum, there being no other focus of disease in the brain. In Lutzenberger's case the first symptoms noted were impairment of vision and attacks of maniacal excitement, with marked impair-

ment of memory and mental confusion later. Toward the last, articulation became imperfect, hearing dull, and there was marked ataxia with a tendency to fall backward. He sank into a state of coma following an apoplectiform seizure and died. At the autopsy a gliomatous tumor was found, which had destroyed the corpus callosum and the white matter of the parietal lobe and adjacent parts of the left hemisphere, extending into the supra-marginal and angular gyri.

Tumors of the Cerebellum.—Quite a number of interesting reports of cases of tumor located in the cerebellum have appeared during the year, most of them with characteristic symptoms. McDonald,⁴⁷_{Jan.} however, describes a case in which the autopsy showed an extensive tumor of the cerebellum, with no symptoms noted during life except insanity. Shaw⁹⁸_{July} reports a case of cerebellar tumor, with monocular diplopia as a symptom. Bremer and Shaw⁶⁵_{July 9} separately describe the same case of a cerebellar tumor occurring in a man who was at different times the patient of each observer. Three cases of tumor in this locality with interesting details are reported by Booth.¹_{June 7; Oct.}²⁴²

Among the many others who have made contributions to the literature of intra-cranial tumors are Steffen,³⁶⁶_{Sept.} Rabat,²¹¹_{No. 8} Faure,²¹¹_{June 1} Wallenburg,³⁶⁸_{Mar.} (2 cases), Russ and Negel,²²³_{No. 3} Aikens,¹³⁹_{Dec. 16, '89} Krafft-Ebing,³_{Nov. 21} Takaki,⁷_{May 9} Hadden,²_{Dec. 21, '89} Noyes and Dana,⁵⁹_{July 6} Pepper and Packard,⁵_{Mar.} Bastian,²_{Nov. 22} Roussel,²²⁸_{Aug. 15} Sinkler,²⁴²_{June} Hinsdale,²⁴²_{Jan.} Tillmans,⁸_{Aug. 2} and Redmond.¹⁶_{Sept.}

Surgical Treatment of Brain-Tumors.—Colquhoun⁵⁵⁷_{July} reports the following extremely interesting case illustrative of the localization of the muscular sense, that was also successfully operated upon. The patient, married, aged 42, first came under observation in January, 1890, affected with left hemiplegia and convulsions, the latter having developed suddenly two years previously. These convulsions were preceded by shaking of the left hand and leg, whilst the head was drawn to the left side during the attack. The paralysis began in the left arm, the face being affected at a much later date. The leg was much less paralyzed than either the arm or face, as the patient was able to move the leg and walk, though with a decided jerk. There was marked impairment of the muscular sense in the left hand and fingers; sensation was otherwise unimpaired. Headache had been pronounced and occasionally

severe. There was some mental confusion and impairment of memory. There was no vomiting whatever. Hearing and smell were normal, but sight was impaired, apparently from slight optic neuritis. There had been a trauma twenty years before, consisting of a severe blow upon the head. This was the only cause determinable. There was easily seen and felt an enlargement on the right side of the vertex rising about $\frac{1}{4}$ inch above the scalp, and $1\frac{1}{2}$ to 2 inches in diameter. Upon shaving the scalp for the operation an old scar was found in the posterior parietal region, closely corresponding to the cortical seat of the lesion. An encapsulated spindle-cell sarcoma weighing 5 ounces was removed from a region that would seem to be about the upper part of the middle third of the ascending parietal convolution; the cortex and subjacent white matter being implicated, although no description is given in words of the location. The cavity left after the removal of the tumor measured $3\frac{1}{2}$ inches in depth. The operation seems to have been successful, the facial paralysis disappearing within twenty-four hours; the convulsions disappearing after three days; the hand being moved a little on the twentieth day, the leg two days later, and four months after the operation the condition is said to have been such that she had assumed control of her house, doing her own washing, had completely regained the use of her left side, no difference being noticeable between the grip of the two hands. She is still conscious of a little halting in the left leg, though she walks well, whilst mentally she is stated to be as well as she ever was.

EPILEPSY.

Types—Jacksonian Epilepsy.—Alexander Koranyi ⁸⁴_{Feb.1} found that by stimulation of the cerebral cortex electrically or chemically, Jacksonian convulsions could then be induced by irritating the skin of the face, and sometimes by irritation elsewhere, even by light and sound. But if, after stimulation of the cortex, the entire cerebrum be intentionally removed, after a short time typical convulsions could still be brought on. It followed that, although the origin of Jacksonian epilepsy was in irritation of the cortex, yet the centre of such convulsions did not lie in the cerebrum (Gross-hirn). The cortex change, which was the basis of Jacksonian epilepsy, stood in the same relations to the convulsion as the scar along the ischiatic in Brown-Séquard's experiment.

Endarteritis and Epilepsy in the Aged.—Crocq²⁸⁸_{July 13} expresses the belief that epilepsy in the aged is sometimes overlooked, being more frequent than is commonly supposed. According to his investigations, when it does occur there is, as a point of departure, a well-characterized anatomical lesion, in an endarteritis of the basilar trunk and its branches. But this is a mere opinion, and must only be valued as such.

Vasomotor Epilepsy.—An interesting case is reported by S. Venturi,⁷⁵_{Mar. 1} to which he applies the term vasomotor epilepsy. The patient, a man 38 years old, was otherwise healthy and intelligent. One brother epileptic; himself the subject of a single attack in his 7th and 33d years. Since his 35th year had had attacks of the following nature several times a day: He would be suddenly seized with an uncomfortable, but not exactly painful, feeling of tetanic cramps in some muscular part, the size of one's palm, most frequently in the flat muscles of the abdomen, but also at times in the face, tongue, and extremities. After this had lasted a very variable time, from a few minutes to half an hour or even an hour, it suddenly disappeared, and there developed a lively sensation of heat, which passed from the affected muscular area to the head, localizing itself in the corresponding side like a glowing coal, and unilaterally accompanied by tinnitus aurium; congestion of the skin, and excessive sweating. Shortly there developed in some other part a similar feeling as of muscular contraction, nearly always in an extremity; then gradually both conditions disappeared (the hyperæmia, etc., and the muscular contraction) without after result. There seemed really to be muscular contractions in the part to which the feeling of contraction was referred. Consciousness was fully preserved during the attacks. Sensation seemed diminished over the muscular area involved. Vision in both eyes was diminished, also hearing on the side corresponding to the hyperæmia of the head. The skin reflexes were normal, the knee phenomena wanting during the attack. The erratic character of the seizures, associated with areas of anæsthesia and diminished fields of vision in a man of neurotic heredity, is emphatically suggestive of hysteria, and the case must be considered of doubtful significance in that the hysterical element seems not to have been radically eliminated.

Procurive or Running Epilepsy.—Fr. Weinstock, of Ber-

lin,⁷⁵_{Apr. 15} in an inaugural address upon running epilepsy, relates the case of a boy of 13 with plagiocephalus, who, since his 5th year, had suffered attacks of loss of consciousness, during which, with wide-open, staring eyes, he ran some steps forward, and, after a few seconds, suddenly stopped and remained standing. The paper contains an elaborate review of the literature of such cases, with the following conclusions: Usually there is absence of auræ. There was often mitral weakness, and frequently the case terminated in regular epileptic paroxysms. They had always developed in childhood or early youth. The etiology, prognosis, and therapy did not differ usually from the same in ordinary epilepsy.

Reflex Epilepsies.—A case³¹⁴_{B. 46, p. 597} of epilepsy is described occurring after crushing of the hand, the fits being brought on by pressure upon an injured finger; the patient also manifested mental changes, and his pupils became unequal. Amputation of the finger relieved him of the fits after the bromides had failed to give any benefit, the mental condition remaining, however, unchanged.

L. N. Somers,⁶_{July} relates the case of a young woman of 20 who had never menstruated and had suffered from frequent attacks of epilepsy. She appeared to have a tumor of the lower abdomen; examination, however, showed the supposed tumor to be retained menstrual blood, the retention being due to an imperforate hymen, which, when incised, caused an immediate disappearance of the tumor and cessation of the epilepsy, which remained permanently relieved.

Bakowski¹⁴ reports a case of epilepsy of more than eight months' duration, with several attacks daily, cured by removal of two decayed teeth. The patient, a young girl of 16, had a disagreeable aura, referred indefinitely to the mouth, and had not been benefited by K.Br. The attacks had not recurred at the end of six months after the extraction of the teeth.

Traumatic Epilepsy.—Hennig,⁶⁹_{June 26} in a critical review of the literature of this subject, relates the history of a boy 4 years old suffering from traumatic epilepsy. Eight days after a wound of the head the boy developed epileptiform seizures. The attacks continued, as many as fifteen occurring in a day, for three months without any improvement. Examination showed a cicatrix 2 centimetres long to the right of the sagittal suture and parallel

therewith. The cicatrix was cut out, and the boy had no more attacks, except a few mild seizures continuing through three days, the result of joy on returning home a month after the operation. The great defect in all these histories of reflex and traumatic epilepsy is that the cases were not long enough under observation to decide the very important question whether the relief was only temporary or whether, as too often occurs, the convulsions returned in the course of time.

Symptomatology.—The handwriting of epileptics has been especially studied by Amédée Mathieu,²¹¹_{May 11} who finds that the writing of epileptics, before and after the attacks, differs from that during the intervals. Before and after it is larger, besides bearing some relation to the intensity of the nervous discharge. He considers this of some importance medico-legally.

Contractures in Epilepsy.—Lemoine,³¹_{July 24} states that contractures consecutive to epileptic attacks are by no means rare. They are, however, infrequently observed through negligence. In the Baillule Asylum such contractures had been specially studied by the writer, and were quite common, although they had to be searched for with care. Contractures consecutive to the attacks were of two sorts: the one permanent, retaining the member whether in extension or half flexion so powerfully as to resist passive movement. Such contractures were seen immediately after the attack. The second sort presented the character of a spasm. Voluntary movements were free, but when one seized the member it remained in a state of contracture in the position it occupied when taken by surprise, so that it could be neither extended nor flexed. The contracture disappeared when the member was released. This form approached that described by Brissaud under the name "latent contractures." It was very probable that the post-epileptic contractures, of whatever form, were due to the lesions of the cortex, or rather to the congestion surrounding such lesion. They doubtless showed the same pathology as post-epileptic paralysis.

Tetanus in an Epileptic.—Camuset,⁹⁴_{July} reports a case of this character. The case was one of idiopathic epilepsy, which had led to mental impairment. The grand attacks had been occurring eight or ten times a month. Tetanus developed after a burn on the hand, first affecting the muscles of the jaws, a few days later becoming more general, affecting the extremities in particular, and

causing opisthotonus. There was absence of epileptic attacks for ten days after the beginning of tetanus, then an attendant saw the patient in an attack. On the twelfth day the reporter observed an attack, which was of regular grand-mal type. The tetanus had already become better by this time, opisthotonus had disappeared, but there was still contraction of the muscles of the extremity. These changed into the epileptiform during the attack, and then again resumed their tonic permanent contraction. The recovery from the tetanus took place gradually, several epileptic attacks occurring meanwhile. He observed in this patient that mania for counting to which Cullerre has called attention as being often present in epilepsy.

Conditions of the Ocular Apparatus in Epilepsy.—Chas. A. Oliver, ⁵_{Nov.} as a result of studies in this field, reaches the conclusion that in epilepsy there is a normal iris and ciliary innervation and action as regards the intra-ocular muscles, and also a normal extra-ocular muscle action and innervation. The investigations were extended to include observations upon imbecility and general paresis, various degrees of abnormal innervation and action being noted in both of the latter affections.

Treatment.—Following the suggestion of Goubert, who obtained most excellent results in the treatment of epilepsy with bromide of gold, and whose observations were subsequently confirmed by Dannillo and Rosenbach, of St. Petersburg, Shtcherbak ⁵⁸⁶_{No. 9} has recently conducted a series of experiments upon dogs with exposed cortical motor areas, with the object of determining the relative value of the bromides of gold, sodium, and potassium. The results may be summarized as follows: (1) bromide of gold inhibits quite certainly the motor cortical centres, and in much smaller doses than either of the others; (2) intra-venous injections of the drug were most effective; (3) excitability of the white substance of motor areas is not affected by gold bromide; (4) the effect seems to be most marked upon the tracts of communication between individual motor centres as well as between the latter and remote cortical areas; (5) as compared with the other two bromides, gold does not appear to possess any cumulative effect; (6) vomiting and depression of pathic sensibility were the only untoward accessory symptoms observed, the first occurring rarely and only from the internal administration of the drug; the latter

slight and only when large doses were used. The relative proportions of bromine in the three salts by weight is: sodium, 77.7 per cent.; potassium, 67.2 per cent.; gold, 55 per cent.

Nach confirms Wildermuth's statements as to the value of amylenehydrate in doses of from 30 to 90 grains (2 to 6 grammes) daily, in the treatment of epilepsy, including petit mal and nocturnal epilepsy. Its good effects are seen in most severe cases when the bromides have failed. It should be remembered, however, that any one of several drugs will manifest the same qualities of quasi benefit, though such benefit is usually of short duration.

Benedikt, ⁵⁷Mar. 17, '99 in a paper upon the therapeutics of organic epilepsy, first classifies the cases into (1) the inherited; (2) epilepsy developing in childhood; (3) hystero-epilepsy or "grand hysteria." The first group showed aplasia; the second, secondary atrophy and aplasia, the third properly belonging in the first group. A second principal group included symptomatic cases, (1) those with disease of the cortex (soft and hard layers) in adults, and (2) reflex epilepsy. The author refers to the diagnostic value of cranial measurements and to topography, and of knowledge of the cause,—aplusia and porencephalus.

Of weight in relation to the treatment was the fact that, aside from the rare motor and sensory phenomena, vasomotor and psychical prodromal symptoms were very commonly present. The vasomotor symptoms consisted in local dilatation on contraction of the blood-vessels, particularly of the face, which quickly came and went. The psychical prodromal symptoms consisted in change of the voice, of intellectual power and memory. These prodromal symptoms gave a basis for rational therapeutics. The physician should avoid, as far as possible, administering drugs, and teach the friends the value of resignation. Above all must we protest against the abuse of large doses of bromide preparations and their long-continued administration. This treatment placed the brain under a cloud, and when carried to the extreme rendered the person weak-minded, and in the young retarded intellectual development. As a means for brain gymnastics in porencephalus, however, this was a most important agent. A part of the so-called cures were to be accounted for by our overlooking the fact that epilepsy after years often disappeared of itself, especially between the years of dentition and puberty. Then frequent lighter attacks, or the hys-

terical form, might thus be changed into rare but severe and more injurious attacks of organic epilepsy. It was best, where intervals of weeks or months intervened between attacks, to do nothing. When attacks took place periodically, with marked vasomotor and psychical prodroma, one could administer for a short time large doses of bromides with atropine. But the most important part of treatment in epilepsy consisted in the culture, care, and looking out for the physical and general well-being of the unfortunate. There should be land institutions for poor epileptics, not connected with asylums for the insane, where they could have an opportunity to make a living. The author thinks special schools for epileptic children are not necessary. With proper attention on the part of the teacher, they could go to the public schools. F. Peterson,^{242 Dec., '89} in a paper entitled "The Colonization of Epileptics," gives a graphic and comprehensive description of the salient features of such an institution at Bielefeld, in Germany, visited by the author.

Laufenaaur^{211 No. 28} claims for the bromide of rubidium and ammonium a better result in the treatment of epilepsy than can be obtained from K.Br. He gives the rubidium and ammonium in doses of 30 grains (2 grammes), at first three times daily, increasing it to 75 grains (5 grammes) if necessary. Syrup of lemon makes the solution more pleasant and palatable. Hystero-epilepsy alone is excepted from the epilepsies amenable to this treatment.

Dijon and Lailier,^{362 Aug. 10} following the observations of Risen, Russell, Taylor, and others, find that the biborate of soda is of some value in controlling the epileptic attacks when bromides fail or are ill borne, though they consider it inferior under other circumstances. The amount recommended is 15 to 30 grains (1 to 2 grammes) a day, increased to 80 grains (5 grammes). Stewart,^{2 Apr. 19} considers the biborate of soda as possessing especial value in nocturnal epilepsy,—an observation which Dijon and Lailier were unable to confirm.

Telford Smith^{166 Oct.} reports a case of congenital epilepsy in an imbecile boy 11 years old, which was very markedly benefited for a time by ligating the left vertebral artery. The fits had averaged twenty to thirty a month. The artery was tied in 1881, and for four years afterward there were no epileptic attacks whatever. The mental condition also improved. The epileptic fits gradually returned in 1885, the attacks numbering in that year 49. In

1888, 231 fits, and in 1889, 245. His condition at the time of the report, mentally and as regards the number of attacks of epilepsy, was about the same as before the operation.

MENINGITIS.

De Cazal³_{Jan. 15} records a case of meningitis consecutive to facial erysipelas. The infection extended from a phlegmonous abscess at the inner angle of the eye along the sheath of the optic nerve to the base of the brain. B. Langrau⁶_{Apr. 26} reports 3 cases of meningitis developing under circumstances which led him to believe that educational pressure and resulting brain overwork was the exciting cause.

Epidemic Cerebro-Spinal Meningitis.—Several interesting studies of this subject from a bacteriological stand-point have been recently made, of which that by Adenot¹⁰⁰_{June 23} is perhaps the most exhaustive. His conclusions are: 1. Several varieties of microbes have already been found in the meningeal exudates. 2. The kinds thus far found in meningitis are: *a*, the pneumococcus; *b*, the streptococcus pyogenes; *c*, the intra-cellular micrococcus of Weichselbaum; *d*, the probable bacillus of typhoid fever; *e*, the probable staphylococcus pyogenes; *f*, the pneumo-bacillus of Friedlander; *g*, undetermined microbes. 3. It is probable that further research will enable us to enlarge this number. All forms of true meningitis are probably of microbial origin. 4. Meningitis is primary and secondary. The last-named form of the disease, developed in the course of infectious diseases, are often the result of the mixed infection, and due to a different microbe from that which excited the primary infection. 5. Certain microbes can locate primarily in the meninges, which do not, however, choose that location habitually. We have reason to believe this of the typhoid bacillus. We may thus admit a cerebral typhoid without typhoid fever. 6. The microbes find their way to the meninges either through a direct route, as in otitis, or by way of the circulation. The last-named course is far the more frequent.

Huguenin,²¹⁴_{Nov. 15, '89} from an extended study of the sources of infection in meningitis, reaches the conclusion that purulent meningitis is always due to micro-organisms, but that serous and fibrinous meningitis are due to a cause which is not yet determined. He recognizes five forms of bacilli capable of exciting meningitis, adding to

those mentioned by Adenot the bacillus-meningitis of Neuman and Scheffer.

Bonome⁵⁰_{Dec.10,'89} claims to have isolated an encapsulated diplo-streptococcus from a meningeal exudate of epidemic cerebro-spinal meningitis, which he regards as different from all other forms yet found in this disease. He does not consider them as a new family of bacteria, but as, perhaps, only a variety of the lancet-like diplococcus of Fraenkel. Netter³_{Mar.12} reports a case of suppurative meningitis following a pistol-shot in the mouth in which he found the pneumococcus associated with the staphylococcus pyogenes aureus. The author considers the case as confirmatory of experiments which he had made in 1886, producing meningitis by trephining and introducing a culture of pneumococci under the dura, the pistol-ball in the man's case laying bare the under surface of the brain just as the trephine had a superior surface in the animals experimented upon.

Tubercular Meningitis.—Herman Rieder³⁴_{Dec.3,'89} contributes a valuable analytical paper upon the subject of tubercular basilar meningitis, basing the analysis upon 32 cases observed at the Munich Hospital. Twenty-four of the 32 cases were secondary to chronic disease of the lungs, which was clinically recognizable. The symptoms were gradual in onset, the most common being headache, vertigo, constipation, psychical symptoms, sleeplessness, and severe vomiting. In only 2 was there a history of chill; in 1 there developed in the beginning right-sided paralysis and paræsthesia and epileptiform convulsions; in 1, facial paralysis. Most of the patients lived only a week or two weeks after the commencement of marked general disturbance. No case recovered. Various motor and other symptoms arose as the disease progressed.

Angel Money²⁶_{Jan.1} relates the history of a case of tubercular meningitis in a child 9 months old, presenting a number of anomalous features. The attack began with a fit, followed soon afterward by left hemiplegia. The child was apparently free from disease, and an unusually well-nourished and healthy-looking infant. The father and mother were healthy, although there was a family history of phthisis on the father's side. Under treatment as an outpatient the condition seemed to be one of steady improvement for three weeks, when a series of fits occurred, followed by unconsciousness. The child remained in a more or less comatose state

until its death, on the twenty-eighth day of the illness. The autopsy showed the case to have been one of basilar tubercular meningitis, with a thrombosis of the large branch of the right middle cerebral artery, which latter explained the hemiplegia.

De Pass⁸⁴⁹_{Oct.} reports 5 cases of tubercular meningitis following a tubercular osteitis, occurring in the service of the Hospital for Ruptured and Crippled, New York. Charlton Bastian²_{Nov.22} mentions the case of a man, past middle age, who died of tubercular meningitis, no old focus of tuberculosis being found at the autopsy. Other cases of tubercular meningitis, with autopsies, in adults, are reported by Demmiteris²²⁰_{Jan.} (2 cases) and Pritchard.²⁴²_{Nov.}

Pachymeningitis Interna Hæmorrhagica.—Northrup,⁵⁹_{Aug.3} in a paper upon this subject, states that in an experience founded upon 1500 autopsies he has met with this condition in only 4 instances. In 3 of the 4 cases death resulted from prolonged convulsions, the fourth dying from an acute enteritis, with no symptomatic evidences of the pachymeningitis except restlessness and slight rigidity. In none of the 4 cases was there noted any paralysis.

Bailey⁶_{Nov.15} reports a case of pachymeningitis hæmorrhagica, evidently of long standing, in a man aged 72, who had been a victim of senile melancholia. Death occurred from convulsions, and the autopsy revealed, on the under surface of the dura covering the right upper parietal region, an encapsulated hæmatoma the size of a shilling. The cyst-wall contained coagula of different ages, and blood-coagula were present in the arachnoid cavity from a recent rupture.

Treatment.—E. Long Fox⁵_{June} in a paper upon the treatment of cerebral meningitis, recognizes as a basis for treatment twelve forms of the disease, exclusive of the tubercular variety. With regard to the last, the author believes that any treatment, to be effective, must be instituted quite early. The occurrence of strabismus he considers an indication that treatment will be of no avail. Counter-irritation is considered of very doubtful utility, since neither the increase of bacilli nor of the inflammatory products is lessened or modified thereby. Inunctions of iodoform he considers useful. The pyrexia, since it is favorable to the increase of these organisms, should be reduced; for this purpose antipyrin is recommended, best given in combination with digitalis. Dauchez¹⁵²_{Sept.12} found, however, that antipyrin, which he pre-

scribed in a case of tubercular meningitis in a child 4 years old, had no action at all upon the temperature, although the child perspired freely. The dose used was 0.40 gramme (6 grains) four times a day.

The author gives precedence, in the treatment of syphilitic meningitis, to the iodide of sodium rather than to the iodide of potassium. Nutritious feeding is considered a most important element of treatment in this variety of meningitis. When sedatives are required, the author considers paraldehyde pre-eminently indicated. Fox says nothing about the treatment of the epidemic form of meningitis. Numerous other papers, however, upon this subject, dealing particularly with methods of treatment, have appeared, among them being papers by Roberts,⁸⁶ Finlay,¹⁰⁰⁰ and Carver.⁴³⁰ Roberts reports several recoveries with a treatment consisting of bleeding to the extent of a pint and a half in the beginning, with an active cathartic, followed by morphia, together with fluid extract of ergot and quinine. After the acute symptoms subsided iodide of potassium was used. Finlay considers the bromide and iodide of sodium treatment as the best, while Carver claims recoveries from the use of ergot and potassium bromide.

Nona, or Sleeping Sickness.—During the past year a peculiar sickness, characterized by a state of more or less profound and long-continued somnolency, and ending, as a rule, in death, has been observed as a limited epidemic in certain parts of Italy and in Hungary. To this disease the name “Nona” has been given by the peasantry, and numerous contributions have filled the local medical press upon the subject. Ketli, of Buda-Pesth,⁵⁷ who officially investigated the malady at the instigation of the Hungarian government, reached the conclusion that the disease as a distinct entity did not exist. He was unable to find an example of the malady, and suggested that the reported cases were simply instances of an unusual somnolence or comatose state, in association with some other disease. Trautjen, on the other hand,⁴ who observed 3 cases, with an autopsy in 1, is disposed to accept the term “nona,” although he considered the disease to be a cerebro-spinal meningitis running an abnormal clinical and pathological course. This peculiar course he attributed to the influence of the recent epidemic of influenza.

Hammerslough¹¹³ describes a case of nona, or sleeping sick-

ness, occurring in a boy aged 14, whom he had treated for influenza three months previously. The boy was seized while at work with a feeling of general depression and of pain in the temporal and occipital regions. Some hours afterward he went to bed, fell asleep, and could not be awakened. He slept five days, then began to awaken, and four days later had fully recovered consciousness. The boy had been previously healthy except for the influenza, of good habits, and there was no trauma. During the sleep there were no motor disturbances or loss of power whatever, and no sensory involvement, except an anæsthesia, which was marked over the forehead, both sides of face, nose, chin, upper neck, and anterior thoracic surface to the axillary line. The anæsthesia was limited, as above, and disappeared with recovery of consciousness.

Henry¹⁹⁷_{Mar. 5} expressed the belief that he had seen a case of nona in a railroad employé who suddenly lost his strength and fell asleep at the depot, continuing to sleep for eighteen hours, though removed to the hospital in the meantime. The pulse and respiration were normal, and there were no symptoms remaining after the patient woke up. Intoxication was positively excluded.

Ludwig Mauthner⁸⁴_{June, July} contributes an elaborate essay upon the pathology and physiology of sleep, "with observations upon nona," in which he describes five forms of sickness characterized chiefly by sleepiness: (1) the sleeping sickness of certain parts of Africa; (2) the "*Maladie de Goyet*," so called from the original description by Goyet, the author having observed a similar case in 1885; (3) the *Maladie de Gerlier*, observed among the Swiss laboring classes in the summer of 1887, and especially among those employed about stables, the symptoms being muscular weakness, vertigo, and sleepiness, with recovery in two or three months; (4) sleep-attacks of the hysterical; (5) nona, if its existence be admitted, which he seems to believe should be done.

If the subject be considered from an etiological stand-point, it is necessary to recognize forms due to [1] intoxication,—(a) unknown vegetable poison (African sleeping-sickness), (b) alcoholism, (c) sulphuric-acid poisoning (Wernicke's disease); [2] infection,—(a) stable-miasm (*Maladie de Gerlier*), (b) miasma or contagium (*Nona?*); [3] fear (*Maladie de Goyet*); [4] hysteria.

The author believes, with Wernicke, that the pathological

lesion involved is that of a poli-encephalitis superior, the inflammatory process occurring in the central gray substance of the third ventricle and of the front part of the floor of the fourth—the symptoms being ptosis, with or without paralysis of one or more of the muscles of the eye, and sleep. Mauthner, with Wernicke, recognizes an acute and chronic form, all those mentioned, with the exception of nona, being regarded as of the chronic variety.

INFANTILE CEREBRAL PARALYSIS.

Henry Ashby,²_{Feb. 8} in a paper entitled “Points in the Pathology of the Paralysis occurring During the First Two Years of Life,” divides such cases from an etiological stand-point into six classes: 1. Intra-uterine lesions (meningo-encephalitis). 2. Meningeal hæmorrhage. 3. Syphilitic arteritis and softening. 4. Acute cerebral paralysis (encephalitis and embolism, etc.). 5. Peripheral paralysis.

Of intra-uterine lesions, the author says the affection (meningitis, etc.) may be much more severe with preservation of life than when similar extensive lesions occur after birth, the semi-venous condition of the foetal blood-supply not favoring acute or violent inflammatory action.

Asphyxia is stated to be an invariable immediate cause of meningeal hæmorrhage, although the asphyxia itself may originate in a variety of causes.

Sachs and Peterson²⁴²_{May} have made a study of cerebral palsies, based upon an analysis of 140 cases; hemiplegias were by far the most common (105), diaplegias next (24), and paraplegias rarest (11). The paper is replete with many facts and observations of value arranged in statistical tables, which add greatly to its merits as a standard of reference. An exhaustive bibliography adds materially to the intrinsic excellence of the paper.

Michel Dansac⁷_{Nov. 6} reports a case of infantile hemiplegia, with autopsy at the age of 32, the paralysis developing at the age of 22 months. There was a history of alcoholism in the grandparents on both sides, cancer in an uncle, and alcoholism with rheumatic arterio-sclerosis in the father. The symptoms were convulsions, followed by paralysis of motion, especially involving the arm, with, later, atrophy and contractures, partial arrest of mental development, and epilepsy. Sensibility was intact. There was facial asymmetry. The autopsy showed a large cyst occupying the position

of the parietal lobe, with marked diminution of the right hemisphere (left hemiplegia). Several of the convolutions were absent, the lobule of the insula, the posterior part of the third frontal, the inferior two-thirds of the ascending frontal, the ascending parietal.

Mansel Simpson²_{Feb. 6} reports 2 cases of infantile cerebral paralysis, one of congenital origin with marked cranial asymmetry. The patient also had attacks of migraine, which alternated with and were apparently substitutive of epilepsy.

Latimer⁵¹_{Feb.} records 2 cases of spastic paraplegia, occurring in the same family. In both the origin was apparently congenital and the paralytic symptoms almost identical. The author remarks, upon the authority of Osler, that this is the only example of a similar occurrence on record.

J. Christian Simpson,³⁶_{Aug.} describes a case of congenital spastic paraplegia, with bilateral athetosis and mental defect, the lesion occurring as a result of long-delayed birth, and being of the nature of a meningeal hæmorrhage.

Acute Encephalitis in Infants.—Friedman,⁹⁴_{Nov.} from a series of studies in the histology of encephalitis in infants, is led to the conclusion, from the results of experimentally induced traumatic encephalitis, that the disease should be broadly divided into purulent and non-purulent varieties. The non-purulent encephalitis he divides into five varieties: 1. A form characterized morphologically by a close assemblage of large, active, round, or cornered epithelioid elements which, though appearing homogeneous, are often loaded with fat or myelin molecules, displaying a normal nucleus which does not exist in the granular cell. This nucleus shows an increase of chromatin and at times well-formed karyokinetic figures, swollen axis-cylinders, normal cells, neuroglia cells, hypertrophied vessel-walls, and perhaps a few granular cells. This form of acute non-purulent encephalitis with active cell growth may exist pure, it may accompany acute purulent convexity meningitis, and it may occur often in innocent embolism. This form is the more common. 2. The second form typically is shown morphologically in the presence of numerous granular cells, normal cells, and hypertrophied vessel-walls, with few, if any, epithelioid cells. This is the form most generally observed in Virchow's encephalitis of the newborn, in encephalomalacia, and from innocent thrombosis and embolism. 3. Hæmorrhagic encephalitis, which is the basis of Wernicke's

polioencephalitis, acute superior. The morphological findings are capillary hæmorrhage and large quantities of granular cells. 4. Inflammations from which cysts, sclerosis, and simple cicatrices originate, except those due to thrombic or embolic softening. 5. Specific or gummatous encephalitis.

Bullard²⁴²_{Aug.} speaks of diffused cerebral sclerosis in children, which is clinically distinguishable by its appearance in healthy children, by the steadily progressive character, and especially by the gradually increasing dementia, which finally becomes extreme at the same time that the child becomes gradually paralyzed, the sensation being comparatively unaffected.

Struempell³²⁶_{B.47,H.1,2} reiterates his description of acute primary encephalitis in children, the first installment of which he presented to the scientific world a number of years ago. As the intervening years seem to have brought him no more proof of his dicta upon the subject than they have brought to other neurologists, discussion of the question may be deferred until the arrival of the evidence. He does, however, give 2 cases of what he terms acute encephalitis of adults,—1 in a man of 67, another in a man of 64,—the symptoms being coma, paralysis of all four extremities, moderate temperature becoming high before death. At the post-mortem examination there was a large area around the cerebral ganglia that was of a spotted, yellow, grayish appearance, spongy and with many punctiform hæmorrhages, and the microscopical examination is said to have shown signs of acute inflammation. Benedict²_{Mar.8} exhibited 2 cases of infantile spastic hemiplegia in whom the tremor of the upper extremity had been removed by nerve-stretching.

MISCELLANEOUS PARALYSES.

Sachs¹_{Jan.13} reports a case of facial paralysis of cerebral origin, with atrophy. The atrophy was principally of connective tissue and subcutaneous fat. There was almost constant spasm of left masseter and temporal muscles, interfering with mastication and enunciation. Tongue distinctly atrophied on the left side and apparently in a spastic condition. No sensory involvement. Hearing and pupillary reactions normal; reactions to electric tests also.

Progressive Paralysis.—Pick⁷⁵_{Nov.15} gives an account of the histology of progressive paralysis. In the brain, which has been hardened in alcohol, he finds, on microscopical examination of the

cerebral cortex, a number of elongated dark bodies, which take the stain well, and are, for the most part, so placed that their long axis is at right angles to the cerebral cortex. These, at first sight, are very liable to be mistaken for the nuclei of the vessels, but further careful consideration shows that their direction is too constant, their size too great, and their standing too deep. Higher magnifying powers show that they are really swellings on the axis-cylinders of the nerve-cells; they are for the most part placed on the nerve-fibre at a point near the cell. These swellings discovered by Pick accord with the changes which other authors have described as likely to be met with in the brain of persons dying of progressive paralysis. They probably constitute the first stages of sclerosis.

Paralysis Agitans.—Peterson¹_{Oct. 11} comes to the following conclusions from a clinical study of 47 cases of paralysis agitans: In 42 the patients were between 40 and 60 years old at the onset; 29 were males; very few, if any, had any decided hereditary taint; in 8 the disease seemed to be due to exposure to wet and cold; in a few cases it was set up by fright and other mental causes, and occasionally a traumatic influence was at work, and the tremor began in the part injured. In all 47 cases tremor was present; it affected the head in 9 out of the whole number; occasionally the tremors were uncontrollable. The average rate of vibration of the tremor was 3.7 to 5.6 per second. In 41 cases there was rigidity; in four-fifths of them the characteristic posture was well marked; in 1 there was marked muscular wasting. Propulsion was observed in 12 cases, retropulsion in 3, and the two symptoms were combined in 9; lateropulsion was present in 1 case; in 9 the knee-, wrist-, and elbow-jerks were exaggerated. In 1 case of eight years' standing the electro-irritability was diminished; 13 showed a modification of the voice, probably due to imperfect action of the laryngeal muscles. Subjective sensations of heat were present in 7 cases, and subjective sensations of cold in 5 cases; a few had other paræsthesiæ. In 7 patients restlessness was very troublesome; 1 had tachycardia, and 1 was mentally deficient. A pill containing codeine, $\frac{1}{2}$ grain to 2 grains (0.03 to 0.13 gramme), and hyoscine hydrobromide, $\frac{1}{100}$ grain (0.0006 gramme), given twice or thrice daily, was found to be the best treatment.

Hemiplegia and Hemianæsthesia.—Bouisson⁷_{Jan. 17} describes an interesting case of right hemiplegia with hemianæsthesia occurring

in a man aged 26, who suffered from pulmonary tuberculosis, the cerebral symptoms depending, as demonstrated at the autopsy, upon tubercular meningitis affecting the convexity of the left ascending parietal convolution and the paracentral lobule. The hemiplegia was of the ordinary type, affecting the leg, arm, and face on the right, beginning as a hemiparesis and deepening as the case progressed into absolute loss of power. The sensory symptoms were, in their order of sequence: hemianæsthesia, limited in the face exactly to the median line; hemianalgesia, diminution of muscular-sense acuity, amblyopia, slight concentric limitation of visual fields, and complete loss of taste and smell on the right. The sensory symptoms disappeared several days before death. At first the case was considered one of hysteria, but, with the deepening of paralysis and the onset of delirium with convulsions, the above diagnosis was considered as established. The results of post-mortem investigation indicated that the original focus of disease had existed in the areas above mentioned, though there existed a condition of more or less diffused meningo-encephalitis. The author regarded the case as having a bearing upon the question of localization, and as supporting the claim of identity in location of motor and sensory function in the same or closely related (anatomically) regions. A critical analysis, however, of the case clearly demonstrates its utter worthlessness for purposes of localization, as it was evidently an organic trouble with a coincident hysteria.

Déjerine⁴¹⁰_{July} makes a contribution to the subject of hemianæsthesia of cerebral origin in a report of a case occurring in a man 58 years old, whose symptoms were right hemiplegia and paraplegia, with contractions of paralyzed extremities, marked diminution of general sensibility on the right, and nystagmus. At the autopsy there was found an old hæmorrhagic focus in the region of the lenticular nucleus affecting the left internal capsule, and atrophy of the tegmentum on the same side. Secondary degeneration of the fibres of the internal capsule was demonstrated histologically, involving the right pyramidal fibres in the cervical cord and both pyramidal tracts somewhat in the lumbar region. In the bulb, there was atrophy of the fibres of Burdach. The author discusses elaborately and with exceeding clearness the relation of the symptoms to the post-mortem revelations,—the paper constituting an exceedingly valuable contribution to the subject.

Hysterical Paralyses.—Charcot,⁷³_{p.36} in a recent lecture calling attention to the necessity for greater familiarity on the part of the surgeon with the various manifestations of hysteria, showed a case of hysterical paralysis in a young bricklayer, limited to the left arm and following a fracture of the left radius. Union occurred quickly, but there was a numbness and pain left. The arm grew gradually weaker until there was little power left and the hand and arm became anæsthetic with the exception of the middle finger. An operation was done to relieve pressure upon the nerve and for its psychical effect. For two months following there was perfect health; then the paralysis (?) returned. At the time of Charcot's examination there was again complete functional monoplegia and complete anæsthesia over the hand and whole surface covered by the shirt-sleeve, ending abruptly at the shoulder-joint. The muscular sense was lost as high as the elbow, but no higher. Other symptoms were: attacks of giddiness, preceded by singing in the ears and throbbing in the temples and followed by severe headache for twenty-four hours, but no distinct hysterical seizures. There was no anæsthesia except as mentioned, but hyperæsthesia in both iliac fossæ and below the left nipple. There was slight diminution of visual fields. Hearing and smell were normal, but the sense of taste was lost over the whole surface of the tongue. Charcot considered the giddy attacks as not due to Ménière's disease or epilepsy, but as being minor hysterical crises. A diagnosis could be made, however, without these general symptoms, the single symptom of a monoplegia with anæsthesia limited strictly at the level of a joint after the manner of a shirt-sleeve (*l'anæsthésie classique en manche de veste*) being sufficient to establish hysteria. Auto-suggestion had benefited for a time, but men were stubborn subjects for hypnotic suggestion as a means of relief for hysterical manifestations. The revival in the patient's brain of the ideas of movement and their motor representatives by means of forced and passive movements is the best plan of treatment.

Féré⁴⁷_{Oct., '89} contributed a classical essay "Upon the Pathology of Night," with special reference to nocturnal paralysis,—a phenomenon of hysteria graphically described by Weir Mitchell in his "Lectures on Nervous Diseases."

Carl Laufenauer⁸⁴_{June 28} reports a case of hysterical right hemiplegia in a young woman, with recovery under systematic faradization.

Bulbar Paralysis in a Child.—Finlayson⁵¹_{Oct.} reports the case of a boy 7 years old, affected with paresis of the neck and ocular muscles, and finally general paretic weakness, with difficulty in speaking and dribbling of saliva, the patient dying of paralysis of the vagus. There was no elevation of temperature or convulsions. The autopsy showed a tubercular tumor affecting the pons, peduncles, fourth ventricle, and corpora quadrigemina, the principal lesion being in the pons and medulla. Kratoszyner¹⁵⁰_{Sept.} also reports the details of a case of bulbar paralysis, with autopsy.

Traumatic Facial Paralysis.—Fred. Tressilian²_{Oct. 11} reports a case of paralysis of the facial and auditory nerves from hæmorrhage into the internal ear and Fallopian canal, the result of trauma. The paralysis of the face was complete, with marked impairment of hearing on the same side, the symptoms remaining more than three months.

Alternate Hemiplegia.—Robinson⁶_{Mar.} reports a case with the above title occurring in a syphilitic woman, who, upon waking one morning, found she had lost the use of her left arm and leg, and that her right eyelid was closed. Subsequently the third nerve became completely paralyzed in all its functions, the left arm and leg paralysis remaining.

Ira von Gieson⁵⁹_{Nov. 15} reports a case of this character due to multiple areas of softening in the pons. The symptoms were aphasia, left hemiplegia with right facial paralysis, and deficient deglutition, with subnormal temperature. The lesions had their origin evidently in a chronic nephritis.

MULTIPLE CEREBRO-SPINAL SCLEROSIS.

That the symptoms of genuine multiple sclerosis may be closely simulated by conditions dependent apparently upon purely functional disturbances is well established. Westphal, Maguire, and Bobinski have each reported such a case, and a fourth is met with in the literature of the past year.³⁴⁸_{Jan. 1} The case presented the symptoms, among others, of a constant tremor of the head; tremors of the extremities, which were typically of the intention type; difficulty and slowness in speech, and well-marked nystagmus. The symptoms followed a mild attack of variola, and disappeared almost entirely in less than four months, under the use of solanine, suggested by Grasset and Sarda. One of these cases, Maguire's,

as was suggested by Seguin, probably represented a form of active cerebral syphilis; others may have been examples of hysteria, though Buzzard,^{6 Feb. 8} considers the opposite mistake of diagnosing as hysteria cases of true multiple sclerosis to be much more frequent.

Sinkler²¹² records an interesting case of multiple sclerosis in which the tremor disappeared on the paralyzed side, following an attack of hemiplegia. Vertiginous attacks, which occurred previously with annoying frequency, also disappeared. Three cases of the disease occurring in children are recorded: 1 by Russell,^{2 Nov. 30} in a girl aged 12, the symptoms following a fall; another reported by Kratoszyner,^{150 July} in a 16-year-old boy, and the third by Leuch.^{214 Jan. 15} That the disease often occurs quite early in life is emphatically established by an abundant literature bearing upon this point. In preparing an article upon this subject for a recent publication upon the diseases of childhood,¹⁰⁶⁴ I succeeded in collecting, with a comparatively limited research, records of more than 60 such cases, the disease developing in one instance in an infant. More careful and extended observations will, I feel satisfied, confirm the recent statement of Oppenheim, to the effect that many cases of multiple sclerosis observed in adults really date from childhood.

"Vertigo of Bulbar Origin" is the title of an address delivered by Buzzard,^{2 Jan.} and by this term the writer would describe a form of vertigo in which all the symptoms are typical of Ménière's disease, but in which he believes that there is no labyrinthine trouble whatever, the lesion being in the auditory nucleus in the medulla. This is about as illogical a paper as is written upon a serious subject, and there is no proof whatsoever of the wild pathological dreams of the author.

Upon the subject of agoraphobia and allied morbid fears, a paper was read by Suckling.^{2 Feb.}

CEREBRAL SYPHILIS.

The following papers have been read upon this subject: Hugo Engel,^{176 Mar.} C. H. May,^{9 Oct. 4} Oppenheim,^{4 Dec., '99} Suckling,^{2 Feb. 8} Oestreicher,^{4 Apr.} Ashby,^{90 Mar.} (this is a case of cerebral softening in a syphilitic child 14 months old), T. S. Wilson,^{32 Nov. 9} Corning,^{1 Mar. 22} Bauke,^{4 Oct. 20} Althaus.^{22 Aug. 6} None of these papers contained more than summaries of our knowledge of the subject, or clinical reports of cases.

DISEASES OF THE SPINAL CORD.

By W. R. BIRDSALL, M.D.,

NEW YORK.

MENINGITIS.

Adamkiewicz,¹¹³
Apr. 27 in his contribution to the pathology of hypertrophic pachymeningitis and chronic infarction of the spinal cord, regards as untenable the prevailing view, maintained by Charcot and Leyden, that the products of pachymeningitis produce by compression a transverse myelitis, softening resulting from the latter, and from the softening secondary degeneration. As a substitute, he advances the opinion that the pachymeningitic deposit extends along the small vessels into the substance of the cord, the small vessels of the periphery being the carriers of the infarction to the peripheral layers of the cord, which are thereby destroyed; while by means of the arteries of the anterior longitudinal fissure the destructive sclerosis invades the cells of the anterior horns and brings about degeneration of the pyramidal tracts, commissural fibres, and the fibres of the anterior root-zones, extending even into the anterior roots; the latter, however, and the spinal-nerve roots in general, are chiefly, and directly, affected by the external pachymeningitic deposit. The foci of softening are the result of infectious cellular infiltration, as the pachymeningitic process was which preceded it. Tuberculosis and syphilis, chiefly the latter, are probably in most cases the diseases from which the pachymeningitis develops.

Weismann²¹⁴
Mar. 15 reports as a case of external suppurative spinal pachymeningitis, the result of a slight trauma, the history of a patient, who, in attempting to lift the hinder part of a wagon, slipped without falling, but experienced a sudden stab in the middle of the back. He observed nothing more until the following day, when the arms became painful on movement; the next day he was obliged to remain in bed and suffered from stabbing, burning pains in the back. Three days later he rapidly lost sensation and

motion in the extremities and dyspnœa supervened. Within three days he became delirious and died with marked dyspnœa. The autopsy revealed a purulent hæmatoma in the spinal muscles, which had penetrated the vertebral canal through the intervertebral foramina (seventh and eighth dorsal), having set up an external pachymeningitis. The pia was congested, but the cord appeared normal macroscopically. There was also beginning cerebral leptomeningitis and hypostatic pneumonia of the left lung. It is important to note that he had recovered from a carbuncle in the neck about a week before his slight accident, which is favorable to the supposition that this was the infective origin of the rapid suppuration, producing an abscess into which hæmorrhage took place, or inducing rapid suppuration in a hæmatoma caused by the accident. The author favors the latter view. The patient had an accidental insurance policy. The possibility of ptomaine poisoning should not be lost sight of to account for the profound depression and abolition of the spinal and cerebral functions, in the absence of discoverable lesions of the nerve-centres in such cases where we have local centres of bacterial infection external to them.

Sinkler²⁴²_{June} reports a case of spinal caries with pachymeningitis involving the dorsal and cauda-equina regions. Cheesy nodules were found in both lungs and thickened patches of dura, on which were cheesy nodules that pressed upon the cord. The arms and legs had been paralyzed, contracted, and atrophied. The microscopical examination had not been completed.

Northrup⁵⁹_{May 10} found extensive internal hæmorrhagic pachymeningitis in an anæmic and emaciated infant 23 months old. Pachymeningitis, he says, is not given by authors as a usual complication of rachitis, and seemed in this case to have been rather a natural accompaniment of the depraved general blood condition.

NEOPLASMS.

Vertebral Carcinoma.—Guinon⁴⁵²_{Mar., Apr.} reports a case of vertebral carcinoma,—a metastatic process following carcinoma of the breast and axillary glands,—for which three operations had been performed within two years. The gradual destruction of the vertebral bodies and consequent shortening of the spinal column in the lumbar region produced a peculiar deformity, consisting of abdominal distension, with folding of the abdominal walls about the level

of the umbilicus. There was no paralysis or loss of sensation, but the characteristic pain was present, due to compression and irritation of the spinal nerves at the place of exit through the intervertebral foramina in the destroyed portion,—a condition which Charcot has so well described, and which is so striking a feature that it furnishes an important clue to the diagnosis, giving, also, the chief element in the nomenclature of the symptomatology, namely, painful paraplegia (*paraplegia dolorosa*), so characteristic of vertebral cancer and other diseases that destroy the vertebral bodies so as to cause their collapse and consequent pressure of the spinal nerves.

Calcareous Plates on the Spinal Cord.—Meyer²¹¹_{Dec. 22, '89} reports, from Teissier's clinic, the findings in a spinal cord from a tuberculous subject who had exhibited paresis of the lower extremities. A fatty and fibrous liver was found and calcareous plates of a milky color on the surface of the cord in its lower portion. Teissier had thought such cases due to syphilis, but ascribed this case to the defective hepatic conditions; yet he was forced to refer the paraplegia in this case to inhibitory causes. Clément, in discussing the case, very justly refused to admit that these plates were the cause of the paralysis on account of their size, position, and character, and particularly as the cord itself had not been examined for internal lesions.

Solitary Tubercle of the Cord.—Herter²¹²_{Oct.} has carefully detailed the history and pathological examination of the cord in 3 new cases of solitary tubercle of the cord, and adds the histories of 21 other cases from literature, all of which are subjected to analysis. He thinks that the clinical history of solitary tubercle of the cord can be more accurately written than heretofore with the help of the facts that are recorded in the given cases. The uniformity of the symptoms in different cases, especially as regards their rapid course, the rapidity with which the usually unilateral symptoms become bilateral, the comparative insignificance of the irritative phenomena, and the frequency with which the signs of tubercular disease in other organs exist, are characters of solitary tubercle of the cord which may help in the distinction both from tumor of the membranes and from other varieties of tumor of the cord.

Syringomyelia.—In the ANNUAL of last year I called attention to the fact that the cases reported for the year diagnosticated

as syringomyelia during life had in no instance been verified by an autopsy, while in the 3 or 4 cases in which an autopsy had revealed syringomyelia the diagnosis had not been made during life, showing that cavities and gliomatous formations of the cord give rise to other groups of symptoms than the classical picture on which the diagnosis is usually made, and which is based on a few autopsies. The literature for 1890 points to the same conclusion. Of the 9 autopsies which are here reviewed, in only 1 was the diagnosis made during life confirmed by the autopsy (Déjerine's). One other case is still in doubt (Gyurmán's), while in 7 the clinical symptoms did not conform to the classical type, and in one of these (Jeffries') there were no symptoms of the disease. Déjerine³_{Feb. 12} also mentions the rarity with which the diagnosis of syringomyelia made during life has been confirmed by the autopsy, saying that at present we have only 5 examples,—Schultze's 2 cases, Kahler's case, 1 by Fürstner and Locher, and 1 by Schultze and Czerny. The history of his own case, in which the patient had been under observation for two years, and his disease diagnosed as syringomyelia, is summarized as follows: Male, aged 54 years. Atrophy of the upper extremities, of the Aran-Duchenne type; kypho-scoliosis, which, with the atrophy, had slowly progressed for more than twenty years; preservation of tactile sensibility, except on the pulp and dorsal surface, of the terminal phalanges, with very pronounced analgesia and thermo-anæsthesia in the upper extremities and right side of the face. Death from pneumonia. Autopsy: brain, slight degree of ventricular hydropsy; spinal cord, central glioma with cavity throughout the cord down to the middle of lumbar enlargement. Déjerine calls attention to the anomalous feature of this case, namely, the slight tactile anæsthesia of the fingers. He found degenerative changes in the cutaneous nerves of the affected parts, to which he attributes the defect.

Gyurmán¹¹³_{Aug. 25, '89} reports a case of syringomyelia in which, aside from the usual atrophy of the upper extremities, there was slight atrophy of the lower extremities, ataxia in the upper and lower extremities, slightly spastic gait, and exaggerated reflexes. Besides analgesia and thermo-anæsthesia of the neck, thorax, and upper extremities, the tactile sensibility, though not entirely abolished, was barely perceptible. It is therefore not a classical case. At a

later date, a society report¹¹³_{June 15} states that "Gyurmán presented a specimen of syringomyelia [presumably the same case] with internal hydrocephalus and chronic granular ependymitis. The positive determination whether the lesion in the cord is a syringomyelia or a hydromyelia must be determined by the histological examination."

Rossolimo⁷⁵_{May 1} reports that a patient, aged 18 years, had total loss of sensation to pain and temperature in the entire left upper extremity and the left side of the neck, thorax, abdomen, and thigh, with preservation of tactile sensibility, but impairment of the sense of location and pressure on the left side, exaggerated left-knee jerk, diminished plantar reflex, ulcer and abscess on the left forearm; other functions normal. Death from a septic process. Autopsy: endocarditis; hæmorrhagic infarction of lungs; abscess of liver and kidneys; blood-clots in the right temporal and left frontal lobes of the brain; no pial abscess; glioma, without cavity, in the left posterior horn of the cervical and dorsal region of the cord; atrophy of the left posterior roots; some reduction of fibres in the left lateral tract; decided atrophy of fibres at the inner and outer borders of the second and third cervical nerves; other fibre changes in the bulbar region. The diagnosis before death is not stated. The symptoms presented are not of the classical grouping, muscular atrophy being absent.

Lamacq¹⁸⁸_{Mar. 16} reports the case of a patient, aged 74, who, after feebleness of the lower extremities for two years, and some difficulty in micturition, entered the hospital (Pitres' service) unable to walk. Voluntary movements were executed with difficulty, particularly on the left side. The muscular sense was slightly altered; cutaneous sensibility was normal everywhere except in the lower extremities, where there was hyperæsthesia, slowness of perception, but normal appreciation of temperature and contact. Vague pains were felt along the vertebral column. The reflexes were normal. The symptoms became aggravated; fulgurating pains, total anæsthesia, and complete flaccid paraplegia involved the lower extremities, followed by a sacral eschar and death. Autopsy: dilatation of the central canal of the cord; periependymal glioma; caseous deposits in the third and fourth dorsal vertebræ; some meningeal tubercles; also tubercular deposits in the apex of each lung; hypertrophy of prostate. Here we have a case of syringomyelia which presented none of the classical symptoms.

Jacquet ³_{Jan. 15, '91} relates an interesting case of syringomyelia with autopsy. Two years after the bite of a scorpion, which necessitated the amputation of the right middle finger, trophic changes appeared, consisting of repeated ulcerations and eschars in the distribution of the right cervical plexus and part of the brachial plexus, accompanied by complete loss of sensibility in all its forms,—pain, temperature, and touch,—with normal sensibility everywhere else. The diagnosis was neuritis extending to the cord, but sparing the anterior horns, as there was no atrophy. The autopsy revealed the error. No defects were discovered in the peripheral nerves or in the anterior roots, but the lesions of syringomyelia were found throughout the length of the cord; in the cervical region, limited to the right side and occupying a point of union between the two horns, impinging on the gray commissure and completely destroying the right posterior horn. There was diminution of nerve-fibres in the posterior and peripheral parts of the right lateral tract and in the posterior columns. In other parts of the cord the gliomatous formation was more diffuse.

Holschewnikoff ²⁰_{B. 119, H. 1} reports a case of acromegaly (thickening and enlargement of the fingers, toes, and prominent parts of the face) in which the autopsy revealed a syringomyelia extending nearly throughout the cord, and also hydromyelia through a certain extent. Examination of the nerves of the brachial plexus exhibited degenerated fibres and numerous hyaline bodies.

Francotte ⁹⁴_{Mar.} describes a gliomatous formation with cavity in a case of secondary degeneration from compression of the cord, due to vertebral caries. No clinical history is given.

Jeffries ²⁴²_{Sept.} reports a case without autopsy, diagnosticated as syringomyelia, which appears to be typical. He also reports a case with autopsy, the clinical history of which (service of Webber, Boston City Hospital) gives no symptoms pointing to disease of the spinal cord, except lateral curvature, pain in the back, hips, and right shoulder, and, a few days before death, numbness in the left leg. Otherwise sensation and motion appeared normal, though the patient was not specially tested for sensibility to pain and temperature, yet otherwise thoroughly examined. Autopsy: cancer of stomach and neighboring lymph-glands, tumor of ovary, chronic parenchymatous myocarditis, double hydrothorax, œdema of lungs, chronic thickening of dura and internal

hæmorrhagic pachymeningitis, anæmia of brain, lateral curvature of spine, syringomyelia, with surrounding gliomatous growth. Sections from the highest cervical to the mid-dorsal region show a cavity, often large, between the gray commissure and the posterior white commissure in the cervical region and the left horn of the dorsal region. Lower down, a second cavity begins behind the central canal, into which it finally merges. There was extensive destruction of gray matter in one of the posterior horns, marked involvement of one of the anterior horns, with destruction of a majority of the ganglion-cells in the dorsal region, and, to some extent, in the cervical region.

Berkley,⁴⁷_{June} in an article on syringomyelia, reports in minute detail the results of the post-mortem examination of a negro aged 38 years, the only history of whose illness was obtained from relatives after the patient's death; he having presented during eighteen months symptoms of a gradually increasing hemiplegia, with spastic symptoms, atrophy of the right arm and leg, with tingling and want of feeling in the right leg. The details of the examination are too complicated to be conveniently summarized. There was found a sclerosis of the direct and crossed pyramidal tracts of the right side in the cord and medulla, which could not be traced through the pons or internal capsule, though granular degeneration of the cortical cells of the motor area was found. In the cervical region of the cord a split was discovered, which extended through the pia into the cord through the right posterior horn and projected as a cavity into the anterior horn. This laceration and cavity was filled with fluid and clotted blood. In the lumbar enlargement a smaller split was found, also filled with blood. Hyaline tissue filled or surrounded part of the cavity, which the writer considers an exudation rather than a gliomatous tissue. He also discusses the subject of hæmatomyelia and analyzes the authentic cases in literature with autopsies.

Of cases reported as syringomyelia without autopsy, a typical case is described by Masius,²⁹³_{May} another by Rosenbach and Schtscherbak.⁷⁵_{Apr. 15} Kretz,⁸_{June 19} reports a case which varies from the classical type in presenting some tactile anæsthesia. Marwedel's³⁴_{Nov. 18} patient exhibited tactile anæsthesia; there was atrophy in the lower extremities; also ocular symptoms, consisting of myosis, narrowing of the

palpebral fissure in the left eye, referable to disturbance of sympathetic centres in the cervico-dorsal region.

Gilles de la Tourette and Zaguelmann⁴⁵²_{Nov., Dec., '89} also report a case in which myosis, narrowing of the palpebral fissure, and retraction of the eyeball were present, which phenomena they refer to paralysis affecting the involuntary muscular fibres innervated from the communicating branches of the first dorsal nerve, making it possible to determine the height to which the gliomatous formation assumed to exist had extended. Armand³_{Aug., '20} reports 2 cases, 1 of the classical sort, the other in which all forms of sensation were abolished. Parmentier⁴⁵²_{Sept., Oct.} reports a case presenting the features of tabes in which the sensory symptoms were of the partial or disassociated form of syringomyelia. He regards the tabetic grouping of the symptoms as due to syringomyelia rather than to a fortuitous union of both diseases.

Déjerine and Thuiland³¹_{Aug., '28} found limitation of the visual field, in eyes otherwise normal, in 7 patients supposed to have syringomyelia; as this has also been a sign of hysteria, its importance is evident. They are not able to explain the phenomena.

The question whether Morvan's disease is dependent on a syringomyelia or upon peripheral neuritis is still under discussion. Joffroy and Achard³_{July 16} maintain that all Morvan's cases have syringomyelia, and base their opinion on a case of the former disease in which syringomyelia was found. They say that the involvement of tactile sensibility will not answer as a distinction, for many cases of syringomyelia fail to show partial anæsthesia, and in some of Morvan's cases the partial form is present. Déjerine,³_{July 6} however, maintains the duality of the phenomena. Morvan found 20 cases in a community of 5000 inhabitants, indicating a peripheral neuritis of unknown infectious origin. Syringomyelia is not distributed in this way.

Hellich⁸⁴⁴_{No. 27} has studied 2 specimens of syringomyelia, from which he concludes that circulatory disturbances of the central arteries of the cord and their perivascular sheaths play an important part in the production of cavities.

There are excellent reviews by Thibierge²⁸⁷_{Oct. 25} (cutaneous alteration of syringomyelia), Jumon,¹⁵²_{July 25} and by Blocq,¹⁰⁰_{Dec. 7, '89} the last two being chiefly based on Bruhl's review³⁶⁰_{July, '89} of the general subject of syringomyelia.

HÆMATOMYELIA.

Krafft-Ebing,⁸_{Dec. 5, '89} in reporting 2 cases of primary hæmatomyelia, confirms Leyden's statement concerning the rarity of this affection as recorded in literature, by stating that of 245 cases of organic disease of the cord which he had observed, in only 3 was this diagnosis made during life or upon autopsy. The diagnosis in his 2 cases rests upon the sudden appearance of severe pain, paralysis, and anæsthesia, the subsequent disappearance of much of the sensory and motor trouble which depended upon shock, and the retention of certain disturbances of function, indicating focal destruction.

MYELITIS.

Anterior Poliomyelitis.—The most important discussion of the year on this subject is that between Déjerine and Blocq upon the character of the lesion producing the so-called acute spinal paralysis of adults. Déjerine maintains that the lesion may be exclusively a peripheral neuritis without central lesions. Blocq maintains that central lesions are present in these cases, with possibly an associated peripheral neuritis in certain forms. Déjerine⁴¹⁰_{Apr.} bases his conclusion on the following description of a case: Muscular atrophy of all the extremities, at the beginning acute and febrile, remaining stationary for eighteen years. Atrophy extremely pronounced in the hands and feet; simian hand, not claw-shaped. Talipes cava, with claw-shaped toes. Integrity of muscles of the trunk, arms, thighs; also of the face, and of sensation. Absence of cutaneous trophic changes. Preserved knee-jerk. Slight quantitative diminution of faradic and galvanic contractility. No reaction of degeneration. Death from pneumonia. Autopsy: Pronounced muscular atrophy of the hands and feet, also of the inferior portions of the forearms and of the legs, diminishing upward; fibro-muscular retraction of the plantar region. Histological examination: Marked changes in the intramuscular nerves of the atrophied muscles, disappearing a short distance above and absent in the large trunks; absolute integrity of the cutaneous nerves of the anterior roots and of the motor cells of anterior horns; simple atrophy of the primitive muscular fasciculi.

Déjerine states that the myelopathic theory of this form of paralysis was based by Duchenne on the analogy of its symptoma-

tology as compared with acute infantile poliomyelitis, and that its proof rests upon one autopsy, Gombault's case, which is far from being an example of poliomyelitis. The lesion consisted exclusively of a pigmentation of the nerve-cells, accounted for by the age of the patient, this being also Westphal's interpretation of the case. There were no focal lesions such as occur in the infantile form, nor an abscess of nerve-cells in large numbers, as found in chronic poliomyelitis. On the other hand, there were undoubted changes in the muscular nerves and even in the large nerve-trunks. The case does not, therefore, demonstrate the existence of a poliomyelitis in "spinal paralysis of the adult," while the existence of a peripheral motor neuritis in his own case cannot be disputed. He believes that a review of the facts will show that Duchenne's "acute anterior spinal paralysis," and his "general subacute spinal paralysis," are due in reality to a peripheral neuritis, and, as is usually the case in the latter, probably dependent on infectious or toxic agents of an undetermined nature. Blocq,¹⁴_{Apr. 20} on the other hand, supports the myelopathic theory for acute spinal paralysis of the adult. He calls attention to Déjerine's "neglect or ignorance" of Schultze's demonstrative case, which presented the typical clinical phenomena of acute spinal paralysis in an adult, and in which the autopsy revealed a pronounced sclerosis, with cellular atrophy limited to the anterior horns, most marked in the regions most affected during life. Blocq goes much further, however; he calls in question the correctness of Déjerine's diagnosis, maintaining that his is not a typical case of Duchenne's spinal paralysis, but probably a case of alcoholic neuritis. Alcoholism was denied by the patient, but he had been a wine-seller; he entered the hospital with swollen feet and had delirium and fever, which did not altogether disappear for a month. Without denying the possibility of a peripheral neuritis affecting the motor nerves alone, I would say that sensory troubles are such prominent features of the great majority of cases of alcoholic neuritis as to constitute a diagnostic sign of importance. They were not only absent in Déjerine's case, but the sensory nerves were found normal at the autopsy,—a strong objection to Blocq's supposition.

In another communication by Blocq and Marinesco,³_{July 9} a case is described which has a far greater resemblance to alcoholic degeneration than the one to which Blocq objected. They state that an

incorrect diagnosis of acute anterior spinal paralysis had been made in this case, which they refer to a polyneuritis, but which, they think, belongs, rather, to the cases described by Korsakoff under the name *cerebropathie psychique toxémique*, a "polyneuritic psychosis," characterized by the sudden and simultaneous development of cerebral disorders and angiotrophic paralysis. Anatomically, in the case of Bloeq and Marinesco, the cord was normal, the peripheral nerves degenerated, though not in proportion to the intensity of the muscular atrophy. They also describe a case of subacute poliomyelitis, with lesion of the anterior horns, exhibiting a very interesting hæmorrhagic exudation, destroying in great part the nerve-cells and fibres, leaving a more or less uniformly-granular substance. Similar changes have been seen by Oppenheim, Schultze, and Rissler. They conclude, as a result of their researches, that there exist morbid changes whose clinical expression corresponds exactly to the disease described by Duchenne as acute and subacute anterior spinal paralysis of the adult, namely, lesions of the anterior horns of the cord. On the other hand, there are symptom groups more or less analogous to the preceding, and whose development may lead to a confusion of diagnosis, in which we are unable to discover appreciable lesions in the spinal cord. It may be affirmed positively that these cases depend on the peripheral neuritis which has been found. In those cases in which amyotrophic polyneurites are accompanied by psychomotor disturbances they venture the possible hypothesis that there are lesions of the entire neuro-muscular arc (cerebral motor area, ganglion-cells of the cord, motor nerves, and muscles), localized, with more or less intensity, along different parts of this system.

Further proof of the existence of both central and peripheral lesions in adult spinal paralysis is given by Williamson,⁹⁰ who depicts with thoroughness the changes found in the spinal cord in acute anterior poliomyelitis of the adult. He refers to the rarity of the cases in which an autopsy has been made, and cites cases reported by Gombault, Leyden, Schultze, and Drummond. His own case is reported as follows: Male, aged 22, consulted Pullen on account of a "numb feeling" in the right hand; next day this extended to the right leg, and also to the left side. The right arm became paralyzed, then the left, and on the third day there was complete paralysis of all four extremities. There was pain in the

back and limbs; the knee-jerks were absent; there was no anæsthesia anywhere; the bladder and rectum were not affected. Rapid atrophy of the muscles of the limbs occurred after the first ten days. The paralysis continued for about three weeks; he then began to regain slight power in the toes and arms. He was removed to a hospital, and died the next day, five weeks after the first symptoms. The cause of sudden death was not discovered at the autopsy. No naked-eye changes were found in the abdomen, thorax, or brain. On microscopical examination the spinal cord exhibited changes in the outer part of each anterior horn throughout the cord, most marked in the lumbar regions. The outer half of the anterior horn was infiltrated with a mass of closely-packed-around nucleated cells, about the size of white blood-corpuscles, and of large, round, or oval nucleated cells. At the periphery of the cell-mass numerous dilated vessels were found packed with red blood-corpuscles, but without real hæmorrhages; the perivascular sheaths were distended with round cells, the small arteries passing to the anterior horn (latero-medial and latero-anterior) were dilated in the same manner. Nerve-cells of the antero-lateral, postero-lateral, and central groups were absent, but the inner part of the horn, the anterior, internal, and median groups, were preserved, though many cells were shrunken and had lost their processes. The fine nerve-fibres were also destroyed in the infiltrated portion. The white matter was normal, except for a few broken-down fibres near the infiltrated parts. The commissures were normal excepting some vascular changes. The fibres of the anterior nerve-roots had, in many places, disappeared, leaving spaces; others were infiltrated with small round-cells, separating them. Fibres were found in different stages of degeneration, exhibiting increase of nuclei, breaking up of the medullary sheath, and, sometimes, destruction of the axis-cylinder. The posterior nerve-roots were normal, with the exception of here and there a degenerated fibre. Pia normal, except on anterior surface, where vascular dilatation was found, and cellular infiltration at the point of exit of the roots. The nerve-cells of Clark's column were normal. Throughout the cord the changes were most marked where the antero-lateral artery, with its sheath distended by cells, entered the gray matter. The ulnar and sciatic nerves showed many degenerated fibres. Staining for micro-organisms gave negative results.

Brown⁵⁹_{Nov.1} describes a case of acute infantile poliomyelitis, occurring in a boy 6 years of age, which terminated in pseudo-hypertrophic paralysis. A younger brother also developed pseudo-hypertrophic paralysis at 6 years.

Kirkham⁴⁷_{Pl.1} records a case of chronic poliomyelitis in a child of 5 years. A slowly progressive paresis of the lower extremities developed, which continued to grow worse for three months, resulting in atrophy, with the reaction of degeneration; then improvement began, and in three months complete recovery had taken place.

Loeb,⁵⁶⁸_{Jan.} in a clinical lecture, reports as infantile poliomyelitis a case the incomplete account of which suggests that it was cerebral, not spinal in origin.

Rokitansky¹¹³_{Dec.29,'89} describes a case of poliomyelitis after carbonic oxide poisoning. Of two girls exposed during a night to the exhalation of this gas from a stove, one recovered; the other had a continuous fever, rapid wasting of the lower extremities, became unconscious, and died on the ninth day, having developed a pemphigoid eruption on the posterior surface of the lower extremities and the sacrum. The autopsy revealed bilateral pneumonia and œdema, interstitial and peritoneal hæmorrhages, thrombosis of the left popliteal, crural, and iliac veins; cerebral hyperæmia and œdema; anterior poliomyelitis, and a perineural hyperæmia and œdema of the sciatic nerve. The author calls attention to the association of trophic changes in the skin, with lesions of the cord and peripheral nerves.

Myelitis from Compression.—Schmaus,¹⁰⁷⁵ in a study of compression of the spinal cord from vertebral caries, made at the Pathological Institute of Munich, reaches the following conclusions: Aside from direct pinching of the cord, due to vertebral displacement, the degenerative changes following caries are the effect of œdema, which, in time, is converted into a diffuse suppurative process. The œdema may be due to passive venous engorgement or to inflammatory changes. Sometimes it is a combination of both. The collateral œdema is to be attributed to ptomaine poisoning, though similar conditions may be produced by chemical agents. Œdema always precedes the myelitis, and those cases which recover are to be explained by a recession of the œdema. Simple myelitis seldom results from caries; there is usually pachymeningitis or simple meningitis. It should not be

looked upon as myelitis dependent on caries unless the process in the cord has all the characteristics of the external disease, as in tubercular caries, only when the process in the cord is also tubercular. All other inflammatory processes are the effects of reactive inflammation following softening, and may terminate in sclerosis. They are analogous to inflammation from infarction. Anæmic and embolic softening are not important factors in degenerations from compression. The onset of the myelitis is chiefly dependent on the rapidity with which the process advances.

Two interesting cases of myelitis from compression, one with, the other without, secondary degeneration, are reported by Coleman.²_{Feb.22} The former, a case of vertebral caries, had pain for eighteen months, sudden paraplegia, with absolute loss of sensation as well as motion; operation; death two months later. Autopsy: cord compressed by granulation tissue; myelitis, with secondary degeneration; disorganization of the eighth and ninth dorsal vertebræ. The second case was due to an abscess.

Rosenbach and Schtscherbak²⁰_{Oct.} give an account of their experiments on dogs for the production of compression myelitis by the introduction of silver plugs into the vertebral canal. Their interesting results are too extensive for reproduction here. They attribute the changes which followed to engorgement of lymph-channels (hindrance to the circulation of the cerebro-spinal fluid), and not to inflammation. Interesting suggestions are advanced concerning the production of syringomyelia.

Myers⁷⁶⁰_{Nov.29} has summarized the results of an analysis of 1570 cases of Pott's disease, studied for the purpose of determining the prognosis of pressure paralysis in vertebral caries. Of these 1570 cases, 218 became paralyzed sooner or later; in 16 the disease was cervical, 12 cervico-dorsal, 105 dorsal above the eighth, 40 dorsal below the eighth, 19 dorso-lumbar, 18 lumbar, and 9 unspecified. The duration of the paraplegia from earliest symptoms to recovery of locomotion was, for the cervical region, twelve months; upper dorsal, nine and a half months; lower dorsal, six months; lumbar, eight months. In those who became paralyzed while under treatment, the period was from one to several months shorter. Eighteen cases had repeated attacks, 2 had four attacks, and a number had had three, with good recoveries. The intervals varied from a few months to four and a half years. The

onset was from thirteen to eighteen months after the vertebral disease began. In no case was the bony lesion below the motor region involved. Paralysis occurred in the upper extremities in only 7 cases. Thirteen had recovered without treatment. The character of the kyphosis does not affect the paraplegia, nor does the presence of or absence of abscess affect the progress of the paralysis. In 55 per cent. recovery is known to have occurred; 3½ per cent. died of intercurrent diseases, and of the remaining 42 per cent. the results are unknown. The paper contains other interesting statements.

Stalker⁶_{Mar. 29} also reports an interesting case of myelitis from caries, with autopsy.

Macewen²_{Apr. 5} describes a case, without autopsy, in which the diagnosis was made of a lesion limited to the cervical region and concentrated at the lower part of the cervical enlargement. The paper contains an interesting discussion of several physiological and pathological questions relating to spinal localization.

Achard and Guinon⁴⁵⁷_{No. 5, '89} report a case of acute myelitis with double optic neuritis, with autopsy, and Eskridge²¹²_{Sept.} also reports a case with autopsy. Changes were found in the cord in both cases. In Achard and Guinon's case sclerotic changes were found in the optic nerves and tracts; in Eskridge's case no mention is made of a histological examination of the optic nerves.

Kronthal⁷⁵_{V. 3, p. 573, 606, 633} reports certain curious malformations or distortions of the cord.

Lesions of the Cauda Equina.—Mills⁹_{Mar. 1} reports, with instructive comments, 3 cases of injury to the spine in which the diagnosis was, for the first case, hæmorrhage into the cauda equina; for the second, fracture of the spine, with hæmorrhage into the cauda equina; and for the third, fracture of the spine, with hæmorrhage into the lumbo-sacral segments of the cord and cauda equina. No operations, no autopsies.

SENILE SOFTENING.

Dana²¹²_{Sept.} reports a case of what he has termed progressive senile paraplegia. As a result of the autopsy he considers the pathological condition as the result of a degenerative endarteritis, with sclerosis, obliteration of vessels, causing softening of the anterior horns and intermediate gray matter. This process was

associated with secondary congestive dilatation of small vessels and capillaries, but not with hæmorrhages, the condition being a softening of the cord precisely analogous to the chronic softening of the brain. Not being inflammatory, it cannot be called an anterior poliomyelitis; not being a primary cell atrophy, it does not belong to the spinal form of progressive muscular atrophy.

AMYOTROPHIC LATERAL SCLEROSIS.

Curtis,¹⁷_{Oct. 14} in reporting a case of this disease, expresses the view that, in his case, there is a double alteration, namely, sclerosis of the lateral column, producing the disturbance of the lower extremities; atrophy of the anterior horn and bulbar nuclei, producing the atrophy of the hands and arms and the labio-glosso-laryngeal paralysis; that, instead of the former being secondary to the latter, both may be the result of some undetermined cause acting simultaneously. He would, therefore, distinguish between amyotrophic lateral sclerosis and lateral sclerosis with amyotrophic changes.

THE COMBINED SCLEROSES.

Ataxic Paraplegia.—Clark⁴⁷_{Pl. 3} reports a case, with autopsy, the histological details of which are very fully given. He says: "If we may take this case as typical of others, ataxic paraplegia is due to a combined sclerosis of the crossed pyramidal tracts, affecting especially the fibres for the lower limbs, and of those fibres from the posterior roots which pass directly to the cerebellum from the lower limbs and trunk, the former in the posterior part of the column of Goll, the latter in the direct lateral cerebellar tract."

Putnam⁵⁹_{July 12} reports a series of 8 cases of combined scleroses, 4 with autopsy and microscopical examination. The symptoms in all consisted of both motor and sensory symptoms in all the extremities, sometimes with and sometimes without inco-ordination. The knee-jerk was exaggerated in all but two or three, in which it was absent. Sclerosis was found in the posterior and lateral columns, varying in position; besides the typical sclerosis, there was evidence of a more recent process, shown by granule-cell formation and breaking down of nerve-tubes along the border of the older lesion. The gray matter of the cord was more or less affected and the nerve-roots in about the same degree.

Friedreich's Disease.—Blocq and Marinesco,⁹⁴_{May} in an exten-

sive article on the pathological anatomy of this disease, report in detail the result of their post-mortem examination of a patient whose case they describe. They also give an abstract of the 9 cases accepted as authentic by Socca, and also by Ladame, which includes 5 by Friedreich, 1 by Everett Smith, 1 by Pitt, and 2 by Rüttimeyer. They describe the lesions found in their own case as follows: Columns of Goll; sclerosis from the lumbar regions to the calamus scriptorius. Columns of Burdack; sclerosis appearing at the inferior lumbar region, but its continuance up to the pyramidal decussation not uniform, being subject to great variations. The antero-external zone of Westphal is normal, while the posterior part of the column of Burdack is affected. In the dorsal region the antero-external zone is not intact, while the posterior part is less affected than in the lumbar region. The lesions commence to diminish on approaching the cervical region and disappear in the lower part of the bulb. The pyramidal tracts present uniform changes like those found in descending degeneration of cerebral origin. The lesion diminishes in the lower part of the bulb. The lesion of the cerebellar tracts begins in the inferior dorsal region, increases toward the superior dorsal portion, not diminishing on reaching the inferior bulbar region. Gower's tract does not seem to be involved thereby. In the cervical region the cerebellar tract appears to exceed its normal limits. In the inferior lumbar region, that part corresponding to Lissauer's zone is affected, although the rest is entirely normal. The external marginal zone is normal throughout. The entire extent of Clark's column is profoundly affected. They found the cord reduced in volume,—a fact noticed by all observers who have made autopsies in such cases,—and that, histologically, the large fibres are reduced in number and the fine fibres very much increased, even in parts not involved in sclerosis. In the latter region, disappearance of nerve-fibres was noticed, occasionally hypertrophy of the axis-cylinder, but no proliferation of the nuclei of the medullary sheath. The nerve-cells were normal, except those of Clark's column, which were atrophied, granular, and had lost their processes. The neuroglia was thickened in the sclerosed areas, or replaced by a compact fibrillary interlacement. The connective tissue of new formation did not consist of the prolongations from the pia, the latter being normal, but was composed exclusively of fibrillary

tissue containing relatively few nuclei and taking aniline colors readily. Certain vessels were entirely normal, others had thickened walls without nuclear proliferation, others were obliterated by compression of the walls, while some were dilated into lacunæ or sinuous cavities, the walls of which were infiltrated with the coloring matter of the blood,—a special form not described by others. They refer to the resemblance of their finding to those of Rüttemeyer and Pitt. They conclude that Friedreich's disease is a developmental disease characterized by a sclerosis of vascular origin occupying, systematically, definitely determined regions of the cord.

Déjerine and Letulle's conclusions³_{Mar.12} on this subject are the most revolutionary of any which have been as yet advanced. It has been established by embryological studies that the neuroglia of the nervous system is of ectodermic origin, and not mesoblastic like connective tissue. Malassez discovered a reaction by which neuroglial tissue may be distinguished histologically from the mesoblastic connective tissue. Pieces hardened by chromic salts are treated by a 40-per-cent. potassa solution for ten minutes; then washed and colored in carmine; again washed, and then treated with crystallized acetic acid and mounted in glycerin. The connective-tissue fibres are decolorized, while the neuroglia preserves a bright color and a distinct fibrillary appearance. Chaslin, applying this pathologically, studied the different forms of cerebral sclerosis, and reached the conclusion that there is a purely neuroglial sclerosis, a gliosis, in addition to connective-tissue sclerosis, or the mixed forms. He found the neuroglial form in epileptic brains. He looks upon this form of sclerosis as due to a developmental defect, and not, like the connective-tissue forms, acquired. Déjerine reaches the conclusion that the sclerosis of Friedreich's disease is also a purely neuroglial sclerosis (*scélrose neuroglitique pure*), this view being based on a case reported by Letulle and Vaquez,³_{Feb.26} in which the characteristic lesions of Friedreich's disease were found; but a subsequent study of the case by Déjerine and Letulle established that the lesion of the posterior columns was of the pure neuroglial type of sclerosis. The scleroses of the pyramidal tracts and cerebellar tracts were not of this type, but contained vascular or connective-tissue sclerosis. They maintain that this is a feature found in no other form of sclerosis; it is a pure neuroglial sclerosis,

—non-vascular sclerosis. They say Friedreich's disease is, then, a gliosis of the posterior columns, a sclerosis of ectodermic origin,—a conception which they regard as important not only from a purely histological point of view, but also etiologically. On this view we can appreciate the hereditary or family character of the affection and its onset during infancy or youth, and also comprehend why the cord is so small. The diminished volume of the posterior horns and the anomalies developed about the central canal in this case, and frequently observed by others, presented a veritable perpendymal gliosis. They would, therefore, divide sclerosis into a pure and a mixed form, the latter always containing vascular alterations. To the first group belongs, so far as at present known, only Friedreich's disease; to the second, all the other forms of sclerosis, such as multiple sclerosis, diffuse sclerosis, and that of tabes, the latter being nothing else but a systematized vascular sclerosis, limited to the entire medullary tract of the posterior roots; the first form is a developmental sclerosis, the second always an acquired form. In referring to the histological findings of other observers, they mention that the same appearances have been found by several, but differently interpreted. Whether Déjerine's view that all other forms of sclerosis belong to the mixed group will prevail remains to be seen. Achard⁷_{No. 8} has already arrived at different results, and says that all varieties of medullary sclerosis, whether diffused or systematized, are of the neuroglial variety.

Auscher³_{July 30} reports a case of Friedreich's disease with autopsy, which corroborates Déjerine's views as to the neuroglial character of the sclerosis. It is described as a pure neuroglial sclerosis, with the vessels and prolongations of the pia normal, the sclerotic tissue being formed of very firm fibrillæ in the form of whorls, and presenting the histo-chemical reaction for neuroglia. The sclerosis was limited to the posterior columns, the other white columns being normal. The posterior roots were normal, except that they presented numerous fibres of small calibre. Lissauer's tract was normal, but the posterior horns were atrophied. The cerebral canal was filled by epithelial cells. The cutaneous nerves were very thoroughly examined and great numbers of fibres found, which resembled embryonic nerve-fibres, but no signs of degeneration,—a new feature,—as methodical examination of the nerves has not heretofore been made in these cases. Déjerine interprets

the absence of lateral sclerosis in this case as favorable to his idea that the degeneration which appears in the pyramidal tracts is a secondary process occurring later than the primary sclerosis of the posterior columns, and somewhat analogous to the combined sclerosis of ataxic paraplegia. Auscher's patient died four and a half years after the onset, at the age of 29 years, and presented the following characteristics: inco-ordination, the Friedreich foot, scoliosis, nystagmus, choreiform movements of the head and trunk, speech disturbances, fulgurating pains; the sensibility otherwise normal.

Déjerine, ³¹_{June 12} under the title "A Particular Form of Friedreich's Disease, with Muscular Atrophy and Disturbance of Sensibility," describes the cases of a brother and a sister, which he summarizes as follows: I. Friedreich's disease, beginning at the age of 14 years, in a male aged 28 years. He had syphilis at the twenty-fourth year; some alcoholic excesses; muscular atrophy very pronounced in the hands, after the Aran-Duchenne type, equally marked in the lower extremities; the Friedreich foot; fibrillary contractions; considerable change in the faradic and galvanic contractility, without the reaction of degeneration; static ataxia; the inco-ordination of hereditary ataxia in walking; kyphoscoliosis; nystagmus; slight myosis with Argyll-Robertson pupil; Romberg's sign; abolition of patellar and olecranon tendon reactions and plantar reflex; considerable change in the different forms of sensation in the extremities, diminishing from below upward; preservation of the muscular sense; intense fulgurating pains; sphincter and genital tracts normal; no cutaneous trophic disturbances. II. Friedreich's disease with muscular atrophy and sensory disturbances, in a woman of 44 years, sister of preceding; beginning at an early age by deformity of the feet, for which tenotomy was done. Double equino-varus very marked; pronounced atrophy of the legs and thighs; atrophy of the upper extremities (Aran-Duchenne type); marked disturbance of sensibility, with retardation of transmission, diminishing from periphery upward; severe fulgurating pains for seven years; muscular sense normal; slight inco-ordination, chiefly in upper extremities; slight choreiform movements of head and trunk; Romberg's sign; abolition of the patellar and olecranon tendon reactions and of the plantar reflexes; nystagmus; sphincters normal; marked alteration in the

electrical contractility without reaction of degeneration. The muscular atrophy and sensory phenomena, which are not characteristic of Friedreich's disease, Déjerine considers are dependent on a peripheral neuritis,—another, though less frequent, phase of the degenerative process of this disease, the earlier lesions of which are in the posterior columns. Rook and Dana²⁴²_{Nov.} report 6 cases without autopsies. Four of these were in one family, and, like Déjerine's special form, sensory disturbances were present in all and muscular atrophy in 2. The 2 remaining cases are less satisfactory, from a diagnostic point of view, ataxia being the only symptom in 1 case, with an uncertain family history, but regarded by Dana as an incipient case. The second case is suggestive of cerebellar disease; it followed a blow on the head. There was no family history of ataxia.

The resemblance of the ataxia of Friedreich's disease to cerebellar ataxia awakens new interest, in view of Menzel's³⁶⁸_{B.22,H.1} paper on hereditary ataxia and cerebellar atrophy, based on a case diagnosed as Friedreich's disease, in which, aside from the usual characteristic lesions in the posterior columns, cerebellar atrophy was discovered, in which Perkinje's cells were absent or sparsely distributed, but no degenerated cells were seen. He regards the cerebellar atrophy not as a degenerative process, but as an arrest of development leading to later disease of the centripetal tracts.

Brown,²⁴²_{Oct.} in an interesting paper on Friedreich's disease, reports 2 cases. The second case is far from conclusive as one of hereditary ataxia.

Erb⁷⁵_{June 15} reports a case which he classes as hereditary ataxia, though there were exaggerated reflexes,—an exception to the rule.

POSTERIOR SPINAL SCLEROSIS (TABES DORSALIS).

Pathology.—Flechsig's article,⁷⁵_{Jan.15} entitled, "Is Tabes a Systematic Disease?" has for one of its objects the correction of a misinterpretation which the author thinks Leyden has made of his views. In addition, he presents the results of embryological work done under his direction by Trepinski on the posterior columns and roots. The subject is an extremely complicated one. At least four different divisions are recognizable by the embryological method, not only in the posterior columns, but also in the posterior nerve-roots, and it is found that the parts which first degenerate

in tabes correspond to certain definite embryological tracts, namely, part of his so-called middle root-zone and the median zone of the posterior columns; while other fibres from the middle root-zone, which develop later, and probably go to the column of Goll, are preserved in tabes.

Mader,⁸_{May 8} in an extended article on the theory of motor disturbances in tabes, expresses the view that the ataxia of tabes does not depend on impairment of motor centres or tracts, and should not be called a disturbance of co-ordination, it being, he thinks, exclusively dependent on disturbances of the sensory reflex tracts, as that for the spinal tendon reflex, producing the peculiar gait of tabes, and the sensory paths to the cerebellum in the posterior columns, the conductors of unconscious impressions for the adjustment of equilibrium. He regards the cerebellum as the sensory reflex centre for equilibration.

Rumpff,³²⁶_{B. 46, p. 35} opposes the sensory theory of ataxia supported by Leyden, Goldscheider, and others, on the strength of a case in which there existed diminution of cutaneous sensibility in the lower extremities, including the temperature sense, but without loss of the sense of position of the limbs; but in the hands and arms, in addition to the loss of sensibility in all its forms, there was decided loss of the sense of position and of passive motion of the joints, together with diminution of the muscular sense. According to the sensory theory, the patient should have been ataxic, but there was no inco-ordination whatever. Other cases are described, and the general topic of ataxia reviewed. Goldscheider,⁴_{Nov. 17} in an extended article on this subject, defends his position against Rumpff's criticisms, and attempts to show that Rumpff's account of his patient's disturbances indicate the presence of a form of inco-ordination.

Kahane,²⁸³_{No. 8} in "A Critical Study of Ataxia," includes, under the general term "function of gravitation," that which is involved in the statics of the body (as shown by Romberg's sign), and its dynamics (ataxic gait); also consciousness of position in space.

Etiology—Syphilis and Tabes.—The vexed question of the relation of syphilis to tabes continues to be discussed. Strümpell,³⁴_{Sept. 30} in an article on the "Nature and Treatment of Tabes," maintains his adherence to the view that syphilis is the cause of tabes in nearly all, if not in all, cases, the small percentage that fail

to give a specific history being accounted for on the supposition that the early signs have been overlooked or forgotten in mild cases. He admits that the relation between syphilis and tabes must be an entirely different one from that which exists between the primary affection and a gumma of the brain or cord, and acknowledges that not only are the tissue changes different from those usually produced by syphilis, but that antisyphilitic treatment appears to have no effect in modifying the lesions in tabes. He advances the gratuitous assumption that the degenerative changes of tabes, which he holds are to-day no longer viewed as being exclusively limited to the posterior columns, but involve the peripheral nerves and the brain as well, must be the effect of a poisonous product of syphilitic origin. Under the influence of syphilitic infection, which slumbers year after year in the system, abnormal products of tissue metamorphosis form, which gradually produce a degenerative action on certain nerve-tracts, like lead, ergot, and other chemical poisons, different toxic agents having a selective action for certain tissues or tracts. He would account for the sudden attacks of pain and the crises, by some outburst of intoxication resulting from an increase or accumulation of the toxic material. He admits that at present our treatment is of little avail, and looks to the future for some, as yet unknown, antidote to his hypothetical toxic agent. Mercury may modify the syphilitic lesions so as to possibly hold the tabetic trouble to a milder grade, and, therefore, should be tried, but we should not expect it to affect the tabetic degenerations already existing. He predicts the downfall of the suspension treatment and advocates chiefly hygienic measures.

Vermel ⁷³_{Feb. 22} concludes that syphilis may provoke nutritive disturbances of the system, which render an individual more liable to tabes than one who has not had specific disease; but he holds that tabes is not a symptom of syphilis, being an independent disease upon which syphilis has only an indirect effect; the same being true for the relations between general paralysis and syphilis. Mercury may not only fail to benefit the tabetic lesions, but may even aggravate them, as it is a poison to the vascular system. Leloir ²⁴_{Dec. 1, '93} recites the history of a patient who, in 1878, developed pronounced signs of tabes; in 1883 he contracted syphilis, from which time the tabetic symptoms rapidly developed. The case proves, he thinks, that syphilis is not necessarily the cause of tabes;

that a patient may be ataxic and syphilitic at the same time without our assuming that he is ataxic because he is syphilitic; and that in syphilitic tabetics the phenomena of tabes may undoubtedly have preceded those of syphilis. Gaucher³_{July 16} reports, as "a case of locomotor ataxia of syphilitic origin cured by specific treatment," the history of a patient who, four years after a chancre, which was treated, developed tabetic symptoms, consisting of lancinating pains, plantar anæsthesia, ataxia, abolished knee-jerk, and diplopia. After a six weeks' course of mercurial inunctions and the iodides, the inco-ordination had nearly disappeared, and soon after (1883) he had entirely recovered. He has remained well since.

Turner⁶_{Nov. 1} relates the interesting history of a married couple beyond middle life, who had suffered from syphilis and subsequently developed tabes in varying degrees. The man had ataxia, the characteristic gait, and Romberg's sign. The woman had little ataxia, but presented the Argyll-Robertson pupil, the characteristic pains, and the abolished knee-jerk. One of the children presented symptoms suggestive of Friedreich's disease, namely, nystagmus, stammering, inability to write steadily, fibrillary twitching of muscles, but no ataxia or loss of the knee-jerk. He had aortic regurgitation. In this connection may be mentioned a case reported by Blackader⁵¹_{Feb.} as "ataxia in a child 12 years of age," which unmistakably belongs to the hereditary group (Friedreich's disease), though the writer objects to this diagnosis on account of the absence of other cases in the family and the presence of migraine and some bladder symptoms: hardly a valid objection, as there are many isolated cases which are typical.

Symptomatology.—Kahler's article⁸_{Feb. 6} on "The Early Symptoms of Tabes" is too extended to be summarized. It is but a review of the subject, yet so interspersed with the personal observations of this able clinician and pathologist that the original will repay perusal. The same may be said of Blocq's article¹⁰⁶_{Mar. 22} on "The Diagnosis of Diseases which Resemble Tabes Clinically."

Weiss¹¹³_{Feb. 9} has observed, as one of the earliest disturbances of function in tabes, the inability to walk backward, to which he says Althaus has also called attention.

Ocular Symptoms.—Rouffinet¹⁰⁰_{Apr. 12} presents a good review of the ocular troubles in tabes. Martin⁷⁵_{Oct. 1} has examined 21 tabetic

patients in Déjerine's service at Bicêtre, and confirms Benedikt's assertion that the onset of optic neuritis in the early stage of tabes is followed by improvement in other symptoms, and retards or arrests the further course of the disease. He could not confirm Benedikt's idea that the early appearance of gastric crises also has this effect. Peterson²⁴²_{July} reports an interesting case of tabes with cranial-nerve palsies (third, fourth, fifth, and sixth), supposed to be of nuclear origin, and with muscular atrophies in the upper and lower extremities. The case had been reported at an earlier stage by Seguin as one of external and internal ophthalmoplegia, with incipient tabes.

Clark⁴⁷_{Autumn} reports a case of locomotor ataxia treated by suspension, with death from septicæmia, the autopsy revealing lesions of the posterior columns, including Lessauer's internal and external tracts, and also a diffuse sclerosis of the antero-lateral tract.

Bullen⁴⁷_{Jan.} records in detail and with thoroughness the clinical history and histological findings in a case of tabes with general paralysis.

There are reviews of the general subject of tabes by Moebius,¹³_{Jan.} Riklin,⁵⁵_{Oct. 25} Woch,⁴_{Oct. 20} Vaughn,⁸¹_{Nov.} and numerous reviews of Leyden's encyclopædic article on tabes.⁵⁷_{Dec., '89;}²⁵_{Jan.} Zenner⁵³_{May 24} reports a series of cases illustrating the types of tabes and diseases mistaken for it.

Auditory Symptoms.—Marini,³⁶⁸_{B. 21, H. 1} in a study of 40 cases of tabes, found that 7 (17.5 per cent.) had normal hearing; 29 (72.5 per cent.) had some affection of the auditory apparatus, of which 4 (10 per cent.) had middle-ear disease; 15 (37.5 per cent.) had positive internal-ear disease, which was also suspected in the remaining cases. Ménière's symptoms were not found in any case. Morpurgo¹⁷_{July 8} states that of 53 cases of tabes 43 had some disorder of the auditory functions. Treitel,⁶⁶_{Oct.} on the other hand, in 20 cases of tabes, found auditory disturbances in only 5 (25 per cent.); of these, 10 per cent. had nervous deafness. He questions Marini's diagnostic methods, and finds that only about 10 per cent. of his cases should be classed as having nervous deafness. He believes that tabes not infrequently causes trophic changes in the middle ear (a sclerotic process) which may lead to disturbances of hearing.

Laryngeal Symptoms.—Van Gieson²⁴²_{July} reports a case of tabes

with laryngeal crisis, in which the post-mortem histological examination revealed, besides the usual characteristic spinal lesion of tabes, a bilateral chronic diffuse neuritis of the vagus and spinal accessory roots, but without involvement of the nuclei of these nerves. The sclerosis of the cord could not be traced beyond the nuclei of the posterior column. Van Gieson reviews the subject of laryngeal and other crises, analyzing the cases and findings of other observers, and explaining anatomically the manner in which the different crises may be produced by peripheral neuritis, which he regards as their most frequent cause, though recognizing that in some cases nuclear lesions have been found. Dreyfuss,²⁰_{B.20, p.154} in an examination of 22 tabetic patients at Mendel's clinic, found 2 in which there was paralysis of the posterior crico-arytenoid muscles; in the others no motor or sensory disturbances were found that could be due to tabes. On the other hand, Marini found frequent changes in the pharynx and larynx of 36 tabetic patients. There were sensory disorders of the pharynx in 14, of the larynx in 10, paresis of the adductors in 10, immobility of the cords in 4, diminished power of adduction in 8, and ataxic movements of the tongue in 9. The pharyngo-laryngeal disorders were more intense in the advanced stages of tabes.

Charcot,³_{June 4} reports 2 cases of tabes in a clinical lecture, 1 with laryngeal crisis, the other with hyperæsthesia to light and sound. Concerning antisyphilitic treatment for tabes, he says that a long experience has convinced him that mercury accomplishes nothing. The irregular course of the disease gives rise to the illusions concerning its efficacy.

Gastric Symptoms.—In another lecture Charcot²¹²_{Mar.} reviews the subject of gastric crisis.

Genital Symptoms.—Bitot and Sabrazès¹⁸⁸_{Feb. 2} examined the spermatic nerves in 2 tabetics whose testicles had been analgesic and atrophied; they were unable to find any lesions of the nerves, but the testicles exhibited sclerotic and degenerative changes. They examined, in Pitres's service, 34 tabetics, 8 of whom had normal testicles, 10 were hyperalgesic, and 16 analgesic; of the latter 4 had atrophy of the testicle. They consider Pitres's sign of great value. It consists in the loss or diminution of the characteristic pain produced in the normal testicle by compression.

Trophic Symptoms.—Verneuil¹⁴_{Sept. 21} has given an interesting clin-

ical lecture on the spontaneous fractures of tabes. He refers to the prompt union which sometimes occurs in these cases. Christian¹⁷_{July 19} appears to be unacquainted with the above-mentioned fact, for he reports a case of tabes with fracture of the leg from a slight injury which united within a month. Its early union causes him to doubt its being the characteristic fracture of tabes. His patient also had what he terms "chronic delirium." He objects to the diagnosis of general paralysis because there were no tremors or speech disturbances; but the history reads like that of an undoubted case of general paralysis.

Audeoud¹⁹⁷_{Sept} carefully reports a case of perforating ulcer and tabetic arthropathy of both feet. He also reviews the literature on this subject. Scott Skirving²⁶⁷_{July} reports a case of arthropathy and another in which peculiar vasomotor dilatations occurred, consisting of a cyanotic appearance of the face, neck, and fauces, occasional spontaneous ecchymoses and curious local sweatings.

Traumatic Tabes.—Klemperer,¹¹⁴_{B.16; H.1,2} in a paper on traumatic tabes, adds 4 new cases of his own to a table of 30 previously-published cases.

Sensory Symptoms.—Germaix,⁵⁷⁷_{Jan.} in an extensive publication upon the sensory disturbances of tabes, not yet completed, reports 62 cases. Many of the patients were treated at the Thermal Hospital of Bourbonne, and the results were almost always negative or injurious under this hydropathic treatment.

Paralysis.—Déjerine,³¹_{Mar. 29} in referring to paralysis occurring as an early symptom or late in the course of tabes, has taken as an example paralysis of the radial (musculo-spiral) nerve, and selects 8 cases, 3 of them personal, the others from the records of Vulpian, Strümpell, Hoffmann, and Nonne. He admits the possibility of coincidence in cases where tabetics have suffered from compression of the nerve in the ordinary way; but in 2 of his own cases and in Strümpell's case the paralysis occurred suddenly without compression. He attributes these attacks, which are more transitory than those due to compression, to a temporary motor neuritis, to which tabetics are particularly susceptible. He also found in his cases that the electrical reaction was lost throughout the length of the nerves, and not, as in compression, from the point of injury downward. He states that tabes is being regarded less and less as a disease limited to the cord, and that it is even doubtful

whether the lesions of the posterior columns are primary. The tendency of accumulating facts is to the effect that they are secondary to neuritis of the posterior roots; that tabes presents more and more the appearance of a peripheral disease of the sensory and motor nerves and the nerves of special sensation.

Treatment.—Rosenbaum⁴¹_{May 15} has treated eleven tabetic patients by hypodermatic injections of nitrate of silver (144 injections; average, 13, varying from 1 to 40; dose not stated). There was hardly any appreciable improvement, except in 1 case, in which the improvement was very decided respecting the pains, ataxia, vesical and rectal symptoms. Müller¹³³_{June 4} regards the treatment of tabes by the Helsing corset as unphysiological in idea and ineffectual in operation. He is satisfied that the treatment of tabes is beyond the sphere of orthopædics. Leyden, in the article above referred to, lays great stress on the use of warm baths (temperature 95° to 86° F.—35° to 30° C.), the duration of which should be from five to twenty minutes. Three kinds of bath are employed: (1) the simple warm bath; (2) brine baths containing CO₂; (3) sweating baths and vapor baths. The first and third kinds are suitable in the early stages of tabes, the second in the more advanced stage. He considers that nerve-stretching has once for all received its condemnation, and has not the least faith in suspension, hoping that it may soon disappear from the therapeutic stage. Of massage he speaks with indifference; of the electric treatment he says it must not be overrated.

SUSPENSION IN THE TREATMENT OF NERVOUS DISEASES.

In last year's ANNUAL attention was called to the rapid decline, toward the latter part of the year, in the number of articles published on this subject, in marked contrast to the flood of literature that appeared soon after the subject became known to the profession, and it was pointed out that few authors had presented a second series of cases. The same thing is noticeable for 1890; with a few exceptions, we look in vain for further reports from those who gave us the first details. The only writers reporting a series of cases this year who had previously published a series are Russell and Taylor, and this an unfavorable series. Gilles de la Tourette gives, it is true, a general statement of the results obtained at Salpêtrière, but no detailed report; and Mitchell, who reports a

series of 23 cases this year, did not report cases in his paper of last year. The largest series of the year is that presented by Rosenbaum, from Mendel's clinic, Berlin. Guttmann, at the discussion of Rosenbaum's paper, ⁷⁵_{p.699} reported 25 cases. These constitute the larger group. Of the smaller ones there are reports by Lippi, ¹⁶⁹_{June} 12 cases; Danillo and Przychadsky, ⁵⁸⁶_{Nos.25-27} 11 cases; Montefiore Home, ⁷⁶⁰_{Dec.14,'89} 8 cases; Stenhouse, ⁵⁵⁷_{Oct.'89} 6 cases; Hamilton, ⁵⁹_{Aug.30} 5 cases; Stewart, ³⁶_{Jan.} 5 cases; Lohmann, ⁴¹_{Aug.28} 4 cases; White, ⁶_{Jan.4} 3 cases; and Powell, ¹⁰⁹_{Sept.} Shaw, ⁶¹_{Feb.1} Cochez, ¹⁷⁵_{Feb.} Baldeschi, ⁵⁸⁹_{Sept.27} Lafferty, ³⁹_{June 2} Anderson, ²¹³_{Jan.} each 1 case, mostly cases of tabes. The contributions for the year continue to show about the same proportion of favorable results, and a considerable unanimity of opinion as to the character of the improvement; there is little concerning the technique of suspension or its contra-indications beyond what was given last year, although some new forms of apparatus will be referred to. Its mode of action has not been much discussed, and the views of those who have ventured opinions appear to be contradictory.

Rosenbaum ⁶⁹_{Sept.11} reports 2500 suspensions in 85 cases, all but 9 cases of tabes; of these, 61 cases of tabes had been long enough under treatment to judge of the results, and 25 of them showed improvement, in 5 the improvement being remarkable. He does not count as improved cases those who simply felt easier or better able to walk for only a short time after suspension. He observed improvement in sleep, sometimes in appetite and bodily weight. The lancinating pains became less frequent and severe, though not permanently disappearing. The most constant signs of improvement, however, were the reduction of Romberg's sign and the ataxia, producing marked improvement in walking. The bladder symptoms improved in 15 cases, and in a less number the rectal reflexes, while in 4 cases sexual power returned. In several cases the gastric crises became less frequent; paræsthesia of the trunk, hands, and feet, however, proved very obstinate. He is skeptical about improvement in the ocular symptoms, such as paresis and atrophy, being due to the treatment. These 2500 suspensions were performed without an accident or serious result, though slight syncopal attacks occurred in 2 cases, and in an hysterical subject occasional emotional phenomena; 20 to 30 suspensions, without favorable results respecting pain and ataxia, he considers a warrant for cessation of treatment. Of the remaining cases, 4 of myelitis,

3 of paralysis, 1 of sclerosis, and 1 of lumbago, the results were negative. He advises against suspension in pronounced cases of myelitis and paralysis agitans. Leyden,¹³³_{June 4} in discussing Rosenbaum's paper, reiterates his opinion¹⁰⁷⁶ that the treatment of tabes by suspension produces no appreciable effect on the pathological process; that neither on therapeutic or scientific grounds is it reasonable to expect such a curative action, and that practical experience, when viewed with an unprejudicial eye, fails to show such effects; none of the results reported, he says, go beyond the effects of suggestion. He attributes the diminution of ataxia and pain to the psychological effect of the patient's hopeful illusions. He also believes the method to be a dangerous one. Remak, at the same discussion, emphasized the view that under any method of treatment a large series of cases of tabes would show a certain number who are growing worse, others who have remained stationary, and still others who show improvement due to the frequent remissions of the disease, notwithstanding its generally progressive character. He doubted the value of the ordinary statistical method, believing that we require a closer study of individual cases, with a more exact comparison of different methods of treatment. While expressing the belief that suggestion is an important element in any improvement following suspension, he thought that increased vascular dilatation may occur as another factor, such as methodical galvanization is known to produce.

Mendel, in responding to Leyden's objections, remarked that he believed all writers on suspension were agreed that it does not cure, but only improves; that the pathological process as such is not disposed of, but the question is an entirely different one concerning the amelioration of certain symptoms, which, it is even admitted, may improve of themselves. Without being an enthusiast for suspension, he regarded it as a method which with care we can use to advantage in a disease the symptomatic treatment of which is so difficult. Rosenbaum, in conclusion, maintained that great care had been taken not to intensify the effects of suggestion in his cases; but he asked, Can the element of suggestion be entirely excluded in treatment by nitrate of silver or by electricity? Yet we continue to use both methods.

Of Guttman's 25 cases,⁷⁵_{p. 639} 10 were of tabes; of these, in 5

the results were negative; in the remaining 5 the improvement was distinctly noticeable by improved co-ordination in walking, disappearance of Romberg's sign, and lessened paræsthesia; but the patellar and pupillary reactions remained unaffected. The majority had from twenty to thirty suspensions about every other day. Of 10 cases of sciatica, 7 were treated by suspension alone, with some amelioration of pain, but without permanent effect. Three cases treated with antipyrin and by suspension were completely cured. In 2 cases of myelitis decided improvement was observed. Pain was relieved after each suspension in a case of kyphosis, but no results were obtained in a case of scoliosis. In a case of vertebral subluxation, with compression of the cord, there was improvement in the paresis of the extremities, bladder, and rectum. He thinks that suspension accomplishes something, though not more than some other methods,—enough, however, to warrant its trial.

Russell and Taylor^{Feb.1}⁶ say of their 21 cases: "In only one of the cases of tabes can we say that there was real improvement." The change was a marked lessening of the ataxia in walking. The patient relapsed, however, within a few weeks. Some patients confessed to feeling better and others thought they could walk better, but there were no objective signs of improvement in this respect to different observers. In none of the cases where optic atrophy was present was there any improvement in vision, and in the organic signs generally no change could be recorded. They were all cases of tabes except three. A case of paralysis agitans improved, but the remaining cases of ataxic paraplegia and disseminated sclerosis were without results. In a more recent paper⁴⁷^{Summer} Russell and Taylor review the entire subject. Comparing their results with those of other observers, they state that their own list includes 32 cases of tabes, of whom 6 improved; in 3 of these the improvement was distinct and steady, but not great, consisting of lessened ataxia and greater steadiness; in the remaining 3 the improvement was not permanent; 23 did not improve and 3 became worse. In a list of 255 cases from other writers the percentage of improvement is 67 per cent.; without improvement, 30.2 per cent.; made worse, 2.8 per cent. In their own cases 18.7 per cent. improved, 71.9 per cent. did not, and 9.4 per cent. became worse. As explaining in part this great divergence,

they remark that "with any new treatment, such as this, every one who obtains good results will at once be inclined to publish them; those who are not so fortunate, and perhaps less sanguine, will not have the same eagerness to announce their unfavorable results. In any great innovation in therapeutics we may be sure that its first year is its best." They refer to the improvement and remissions in certain symptoms of tabes, and cite Cherton's case, in which improvement occurred while they waited for the suspension apparatus to be mended. That some of the improvement in suspension is due to the mental effect, they think may be assumed, though how much is difficult to establish. "With the experience we have had with suspension in tabes," they say, "it will be readily understood that we are not inclined to give the treatment much credit for relief, and far less for cure, of any of the serious symptoms."

Of Mitchell's 25 cases (summarized by Hinsdale¹¹²_{Apr.}) 20 were of tabes. In analyzing these cases we find that the patients became worse in 3 cases, no change was observed in 8 cases, and slight improvement occurred in the remaining 9 cases. The improvement consisted in more or less amelioration of pain in severity or frequency, slight improvement in standing and walking, and slight improvement in bladder symptoms (pain in 1 case; pain and gait in 5; pain, gait, and bladder in 1; pain and bladder in 1; rectal and erectile power in 1). Mitchell does not refer to the therapeutic results in these cases, but to the physiological effects of suspension on pulse, respiration, and anatomical extension. The average pulse of 14 ataxics, taken in the sitting position before suspension, was 89. The extremes were 120 and 68. The average during suspension was 113. The common rise was from 20 to 30 beats; but early in treatment it was, in rare cases, as high as 30 to 50 beats. The average pulse in the sitting position five minutes after suspension was 82, slowly reduced to normal. The average respiration was 17 before, 23 during, and 20 after suspension. The gain in length, from the vertex to the end of the coccyx, measured near the end of suspension lasting from ten to twenty minutes, gave variations from $\frac{3}{8}$ inch to $1\frac{3}{8}$ inches, as individual averages. The individual variations from day to day were also great. The maximum of stretching was reached within ten minutes. It should be remembered that Mitchell's method of suspension is head-and-elbow, not hand-and-axillary suspension.

Danillo and Przychadsky,⁵⁸⁶_{Nos. 25-27} in 11 tabetic males, observed improvement in most of the cases, so far as the pains, paræsthesia, gait, Romberg's symptom, and genital symptoms were concerned; also respecting sleep, appetite, and general condition; but not in the principal symptoms, such as loss of the knee-jerk, ocular palsies, and anæsthesia. Lippi¹⁶⁹_{June} reports 12 cases, including the following conditions and results: Disease of the postero-lateral columns—improvement in power of legs, genital functions, and anæsthesia; hemiplegia with contractures, epileptic attacks, and anæsthesia—improvement in all the phenomena; progressive muscular atrophy—improvement; tabes—improvement in co-ordination and in rectal and vesical symptoms; impotence after masturbation—slight improvement; infantile paralysis—no improvement; hysteria—improvement in the paralysis and pain. K. B. P.⁷⁶⁰_{Dec. 14, '89} reports 8 cases of tabes from the Montefiore Home. In 1 case pain was relieved, the constriction-band disappeared, inco-ordination became less marked, and the patient could stand for a few minutes. Pain, paræsthesia, and general nutrition improved in 2 cases; in another pain was the only symptom affected; another patient became less restless; in 1 the only effect was improved nutrition; and with the 2 remaining patients no changes were observed.

Stenhouse⁵⁵⁷_{Oct. '89} states, concerning his observation of 6 cases of tabes under suspension treatment, that the chief points noticeable are the relief of the lightning pains, considerable improvement in general nutrition, marked improvement in walking, and relief from bladder and gastric troubles, but with little effect upon the ability to stand with the eyes closed, and none whatever on the tendon reflexes or the state of the pupils. Hamilton⁵⁹_{Aug. '90} reports favorable results in 5 cases of tabes, and states that he has employed suspension in many others, which were atypical or only occasionally seen, as a rule, with encouraging results, although on many occasions the treatment was not followed by relief. Grainger Stewart³⁶_{Jan.} reports remarkably favorable results in 5 cases (tabes 2 cases, spastic paraplegia 3 cases), consisting of diminished pain, disappearance of Romberg's symptom, improvement in numbness, gastric cases, bladder and sexual symptoms, and decided improvement in gait in 1 or more of the cases. Lohmann⁴¹_{Aug. '88} reports favorable results in 4 cases of tabes, the improvement consisting in

relief of the lancinating pains, disappearance of the constrictive band, improvement in the vesical and genital functions, sometimes diminished numbness of the feet; but no changes in Romberg's symptom, the abolished knee-jerk, the abnormal pupillary reaction, or the strabismus. White⁶_{Jan.4} reports 3 cases of tabes, in 1 of which, after the patient was first suspended, his temperature rose, within two hours, to 101.8° F. (38.8° C.); at the same time he had a rigor. The next day his temperature was 102.2° F. (39° C.). Every subsequent suspension caused a greater or less rise of temperature, and after the third suspension it took seven days to regain the normal point. The result of frequent suspension was to keep it ranging about a degree above normal. Pain, anæsthesia, and power of walking were improved; the other symptoms remained unchanged. With his second patient the gait improved, the pains and gastric crises became worse, and the other symptoms remained unaltered. The sensory symptoms of the third patient were slightly improved, the ataxia became a little worse, but the other symptoms were not changed.

In Anderson's case of tabes²¹³_{Jan.} the patient thought he could walk better, but no improvement could be observed. There was cessation of pain for a long time, and improvement in rectal, vesical, and genital symptoms. Cochez¹⁷⁵_{Feb.} also reports a case of tabes, with atrophy of the optic nerve, in which the patient's gait, the pains, constipation, and appetite improved; and, more remarkable still, he maintained that his vision, which had been reduced to the mere perception of light, had improved so that he was able to distinguish men from women by the difference in appearance of their dress. Lafferty³⁹_{June 2} reports a case of tabes in which only temporary improvement followed the suspension. Baldeschi's⁵⁸⁹_{Sept.27} case is one of Friedreich's disease. Shaw⁶¹_{Feb.1} refers, in a clinical lecture, to a patient treated with benefit by suspension. He calls it a case of alcoholic or pseudo tabes. It is clearly a case of alcoholic neuritis. Powell¹⁰⁹_{Sept.} reports improvement of sensation in a case of traumatic myelitis. He favors its trial in traumatic injuries of the spine.

Gilles de la Tourette,⁴⁵²_{May, June} in an article upon certain modifications of technique in suspension, states, as the result of his observations on the large number of patients which Charcot has treated at Salpêtrière, amounting now to over 500 tabetics, that each 100

patients, after twenty or thirty suspensions, may be divided into three groups, consisting of 20 to 25, in which amelioration has occurred in nearly all their symptoms, particularly the fulgurating pains, motor inco-ordination, and genito-urinary troubles, without change in the ocular or patellar signs; 30 to 35 which show improvement to some extent in one or more of the symptoms, but not in all; the remaining 35 to 40 receive no benefit, or the improvement is too transitory to be considered. Of the two first divisions the results obtained persist if suspension is continued. In other words,



FIG. 1.

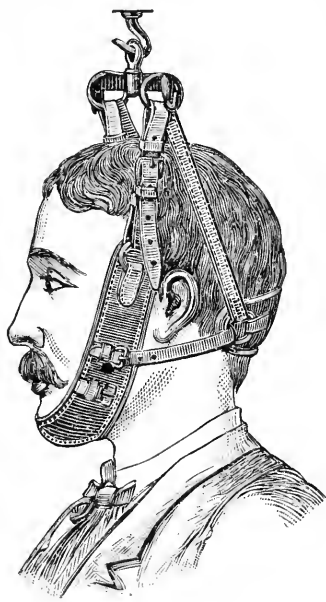


FIG. 2.

MOTSCHUTKOWSKI'S SUSPENSION APPARATUS.

(Nouvelle Iconographie de la Salpêtrière.)

very marked amelioration occurs in 25 per cent., incomplete amelioration in 30 to 35 per cent., and negative results for the rest. In paralysis agitans, as formerly maintained by Charcot, improvement occurred in the general condition, in sleep, and through diminution of painful rigidity. Aside from temporary syncope and 2 cases of transient radial paralysis from compression, he has never seen serious accident after an experience of more than 10,000 suspensions; but, in order to avoid unpleasant results, it is, first of all, necessary that suspension be tolerated. The anxiety of the patient during the first trial, particularly in pale and anæmic

subjects, must be obviated by a gradual increase in the duration of suspension, calming him by talking in order to divert his attention while he is being almost imperceptibly raised or lowered. They now use at Salpêtrière a modification of the Sayre apparatus, suggested by Motschutkowski, in which the chin-piece is more adjustable. Fig. 1 shows the old form, Fig. 2 the modification. By its use the head is maintained in a physiologically erect position not attainable by the old form. The axillary straps have not been modified. Finally, he suggests that, after twenty or thirty suspensions without improvement, treatment should be suspended; but even then the patient need not give up all hope; after an intermission of one and a half or two months, treatment may frequently

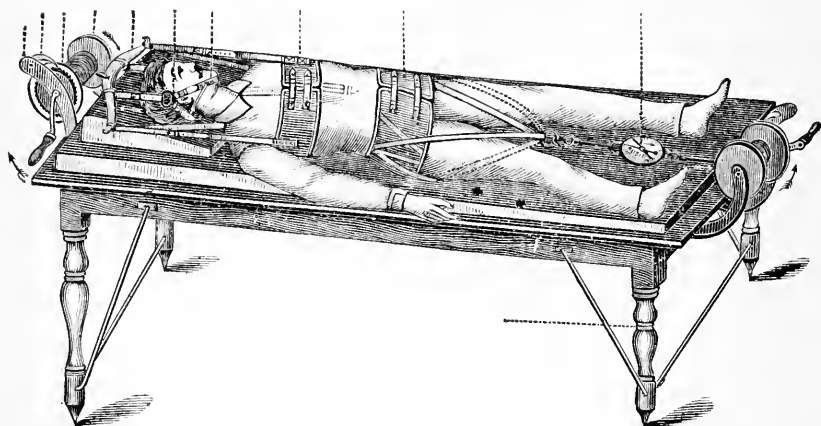


FIG. 3.—WEISS'S APPARATUS.
(*Centrallb. für d. Gesamte Therap.*)

be resumed with benefit. Those who have been under treatment for a long time, and treatment has come to a stand, may also undergo rest for one or two months without losing the benefit of the former suspensions. Concerning other modifications of apparatus, Hamilton ⁵⁹_{Aug. 30} recommends a movable inclined plane, the patient's feet being fastened to one end, so that extension is made when the head is lowered. The board is 6 feet long, 18 inches wide, and is mounted in the middle on two iron trunions, which work in bearings upon a frame-work 3 feet high. A system of hooks and cogs permits adjustment of the board to any angle. He considers it less troublesome, just as beneficial, and no disagreeable effects have followed its use. Weiss ¹⁶⁹_{Feb.} describes what he terms his "distraction method." The apparatus

is sufficiently well shown in Fig. 3. He has substituted an inclined plane for the horizontal one used in his first applications. Stillman⁸²_{Sept. 6} recommends, for the treatment of tabes, his upright and recumbent curved-board frames (Fig. 4 and Fig. 5), devised for orthopædic purposes. He says: "I would advocate in the treatment of locomotor ataxia, in addition to the constitutional treatment: 1. The use of both the erect and recumbent curved traction frames as being superior both in principle and practice to the Sayre suspension apparatus employed by Motschutkowski and Charcot. 2. The use of traction while the spine is curved anteriorly, to produce the greatest possible degree of elongation of the cord and spinal nerves consistent with a requisite amount of rest, comfort, and freedom from danger. 3. The use of traction while the spine is curved posteriorly, to increase the vital power. 4. The use of appropriate gymnastic exercises during the curved traction to restore impaired muscular function and improve general nutrition. 5. The use of appropriate forms of electricity and massage during traction."

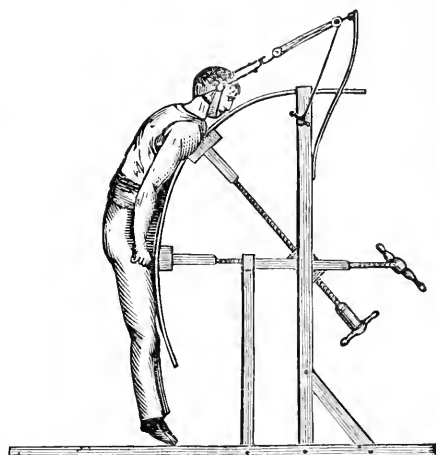


FIG. 4.—UPRIGHT SPINAL EXTENSION FRAME.
(ANTERIOR CURVED POSITION.)
(*Weekly Medical Review.*)

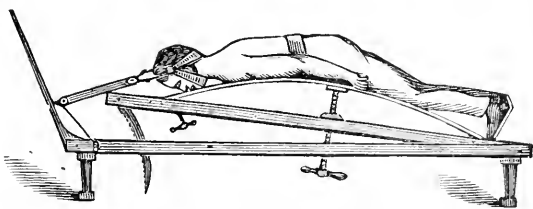


FIG. 5.—RECUMBENT SPINAL EXTENSION FRAME.
(ANTERIOR CURVED POSITION.)
(*Weekly Medical Review.*)

Bonuzzi²_{Nov. 30, '89} has tried a forcible flexion of the spine, as a substitute for suspension, by forcibly flexing the body with the knees bent on the abdomen. A tabetic female treated in this manner showed material improvement. He had already experimented on the cadaver, and reached the conclusion that, during suspension, the relations of the spinal cord to the spinal column are so changed that the cord is displaced upward from 3 to 4 millimetres, and the

vertebral column lengthened from $1\frac{1}{2}$ to 3 centimetres, this increase in length being due to a separation of the processes rather than of the vertebral bodies. The nerve-roots are displaced, but not noticeably shortened, with the exception of the cauda equina; there is lowered tension of the cerebro-spinal fluid. He regards the beneficial effects of suspension as due to traction upon the cauda equina, stretching it, and through it the spinal cord; this, he thinks is best accomplished by forcibly flexing the body with the knees upon the abdomen.

Lydston,⁶⁶³_{May} on the *rationale* of extension in diseases of the spinal cord, on the contrary, while admitting that experiment on both the cadaver and the living subject demonstrate that the spinal column may be extended, does not believe that this extension is sufficient to stretch the loosely-attached spinal cord, or secondarily to stretch the spinal nerves. He admits that extension does produce both local and general improvement in nutrition, but denies that it can be attained through traction on the cord or nerves. He proposes the theory that by extension the capacity of the spinal canal is increased longitudinally, resulting in "an aspiring or suction force along its entire length," producing an active determination of blood to the part, with a consequent stimulation of the functions of the cord and an improvement in nutrition, which lasts for some time after removal of the tension; that there is also a lessening of resistance to venous flow.

Cagney,²_{Jan. 18; July} on the other hand, after extensive experiments on the dead and the living body, denies that it is possible to stretch the spinal cord or the nerve-roots by suspension; that, instead of extension of the spinal canal, there is a total shortening of it; in the lumbar region the end is unaffected or slightly relaxed; in the cervical region the membranes are somewhat stretched, but throughout the dorsal curve the cord lies upon its convexity; and in extension the straightening of the cord separates the vertebral bodies anteriorly, but their posterior borders are pressed together and the neural arches and spinous processes are approximated; as the neural arches inclose the spinal cord the latter is also relaxed. This effect of gravity is further added to by muscular tension during life, the shortening being therefore greater in the living body than in the dead. He inferred, therefore, that if the cord is benefited by suspension, it is by relaxation and not by stretching.

PERIPHERAL NERVOUS DISEASES, MUSCULAR DYSTROPHIES, AND GENERAL NEUROSES.

By PHILIP COOMBS KNAPP, M.D.,

BOSTON.

PHYSIOLOGY AND PATHOLOGY.

Contraction and Diminished Conduction.—Goldscheider⁶⁸_{June} diminished the power of conduction in the sciatic by alcohol vapor and cocaine. On sending stimuli through this nerve the resulting muscular contraction was less intense and the height of the tetanus more slowly reached, the maximum contraction being delayed and the decline being more protracted, corresponding to the faradic reaction of degeneration in man.

Delayed Sensation.—Goldscheider⁶⁹_{July 31} has also experimented on the delayed conduction of sensations. The elements in the time of perception are five: 1. The action of the excitant on the end-organ. 2. The sensation in the end-organ. 3. The conduction in the nerves and cord. 4. The excitation of the central ganglion-cells. 5. The transfer to a psychical process. All these periods vary greatly, the third being of the least importance. Strong sensations are perceived sooner than weak; irritation of sensitive parts sooner than irritation of those slightly sensitive. As soon as sensibility is diminished there can be detected a slight delay in the tactile sensibility. In previous experiments Goldscheider found that mechanical excitation of tactile sensibility caused a secondary sensation of pain. This, he now thinks, is due to the summation of sensations,—a process occurring probably in the end-organs or in the ganglion-cells.

Sense of Power.—Köppen⁷⁵_{July 15} finds very different results in examining the sense of power in hemiplegics, as tested by Hitzig's kinæsthesiometer. Most of them with the paralyzed hand call heavy light and light heavy, even where the pressure-sense and the sense of weight are intact; but there are variations as yet inexplicable.

Nerve Terminations.—Babes and Marinesco,¹⁰_{June 24} find a striking analogy between the lesions in muscles caused by microbes and those found in myopathies: in the latter they find that vascular changes are common, and later they find interstitial infiltration and hyaline degeneration. They believe that vascular changes play a great part in the myopathies. After nerve-section they find proliferation and hyperplasia of the nuclei in the motor plates, and, later, degeneration and an embryonic state of the muscular nerves, with the appearance of umbellated bundles of newly-formed nerves as regeneration begins. In simple atrophy there is atrophy of the motor plate; in simple hypertrophy and Thomsen's disease, hyperplasia; in typhoid, a simplification of the plate; in pseudo-hypertrophy, a disappearance of the terminal ramifications and a proliferation of nuclei, which in neuritis is still more marked.

Pilliet,⁷_{May 30} has found small fibres in muscle surrounded by a special sheath, confirming an observation of Babinski. They are seen most readily in atrophied muscles, but cannot, as yet, be regarded as significant. Sibut,⁷⁵_{Mar. 1} finds atrophy in the convolutions in 23 cases after atrophic paralyses and early amputations, and regards it as of value in establishing the location of given centres. Morpurgo,⁸⁴⁴_{Apr. 9} finds that in parts of the body where vasomotor paralysis is produced processes of repair and regeneration are more rapid. Iodovsky,⁴⁷_{No. 3} after irritation of nerves, finds vacuolization, coagulation necrosis, and degeneration of peripheral fibres in the ganglion-cells.

MUSCULAR ATROPHY.

Raymond¹⁰³⁵ has published a valuable monograph which sums up our present knowledge in regard to the different forms of muscular atrophy. He divides the pathological processes taking place in the muscle itself into five classes: (*a*) interstitial myositis; (*b*) interstitial lipomatosis; (*c*) simple atrophy (disappearance of some fibres without apparent alteration of those that remain); (*d*) parenchymatous degeneration, granular, fatty, hyaline, or amyloid, attacking the fibrillæ; (*e*) parenchymatous myositis, with modification of the structure of the fibrillæ, proliferation of muscular corpuscles, eventual transformation of these into fibrillæ (true hypertrophy), or degeneration (inflammatory) of the proliferated cells. These processes usually co-exist in atrophied muscles, but simple atrophy is never seen as an isolated process. Nearly all the processes,

therefore, are inflammatory. He classifies the different forms of atrophy in four different ways as follows:—

- | | | | | | | | | | | | |
|---|---|--|-------------------------|---|---------------------------------|-----------------------|---|---------------------------------|-------------------------|---|--------------|
| A. Based on the nature of the histological process in the muscle. | { | Parenchymatous myopathy.
Interstitial myopathy. | | | | | | | | | |
| B. Based on the seat of the primary lesion. | { | Myopathic atrophy.
Neuropathic atrophy.
Myelopathic atrophy. | | | | | | | | | |
| C. Based on the distribution and evolution of the atrophy. | { | <table border="0"> <tr> <td>Circumscribed atrophies</td> <td>{</td> <td>Myopathic
or
Neuropathic.</td> </tr> <tr> <td>Progressive atrophies</td> <td>{</td> <td>Myopathic
or
Myelopathic.</td> </tr> <tr> <td>Diffuse atrophies . . .</td> <td>{</td> <td>Myelopathic.</td> </tr> </table> | Circumscribed atrophies | { | Myopathic
or
Neuropathic. | Progressive atrophies | { | Myopathic
or
Myelopathic. | Diffuse atrophies . . . | { | Myelopathic. |
| Circumscribed atrophies | { | Myopathic
or
Neuropathic. | | | | | | | | | |
| Progressive atrophies | { | Myopathic
or
Myelopathic. | | | | | | | | | |
| Diffuse atrophies . . . | { | Myelopathic. | | | | | | | | | |
| D. Based on the etiology | { | Atrophies consecutive to an <i>external exciting cause</i> (circumscribed atrophies). Muscular over-exertion (progressive myelopathic muscular atrophy).
<i>Morbid Heredity</i> .—Progressive myopathic muscular atrophy.
<i>General Causes</i> .—Infection, intoxication (diffuse atrophies). | | | | | | | | | |

The different affections which give rise to muscular atrophy may be arranged under this classification as follows:—

- | | | | | | | | | | | | | | | |
|---|---|---|---|---|--------------------------------|---|---|----------------|---|---------------------------------------|---|--|---|---|
| Circumscribed atrophies | { | Atrophy from compression.
Atrophy in inflammatory conditions (pleurisy, joint disease, etc.).
Atrophy from injury or inflammation of individual nerves. | | | | | | | | | | | | |
| Progressive atrophies | { | <table border="0"> <tr> <td>Progressive spinal muscular atrophy; type, Aran-Duchenne.</td> <td></td> </tr> <tr> <td>Progressive myopathic atrophy.</td> <td>{</td> </tr> <tr> <td></td> <td>{</td> <td> Pseudo-hypertrophic muscular paralysis.
 Type, Leyden-Möbius.
 Type, Zimmerlin.
 Type, Erb.
 Type, Landouzy-Déjerine. </td> </tr> <tr> <td>Type, Charcot-Marie.</td> <td></td> </tr> </table> | Progressive spinal muscular atrophy; type, Aran-Duchenne. | | Progressive myopathic atrophy. | { | | { | Pseudo-hypertrophic muscular paralysis.
Type, Leyden-Möbius.
Type, Zimmerlin.
Type, Erb.
Type, Landouzy-Déjerine. | Type, Charcot-Marie. | | | | |
| Progressive spinal muscular atrophy; type, Aran-Duchenne. | | | | | | | | | | | | | | |
| Progressive myopathic atrophy. | { | | | | | | | | | | | | | |
| | { | Pseudo-hypertrophic muscular paralysis.
Type, Leyden-Möbius.
Type, Zimmerlin.
Type, Erb.
Type, Landouzy-Déjerine. | | | | | | | | | | | | |
| Type, Charcot-Marie. | | | | | | | | | | | | | | |
| Diffuse atrophies | { | <table border="0"> <tr> <td>Anterior poliomyelitis</td> <td>{</td> </tr> <tr> <td></td> <td>{</td> <td> Infantile form.
 Acute, of adults. Spinal paralysis, with rapid course and curable (Landouzy-Déjerine).
 Subacute and chronic form.
 Chronic mixed form (Erb). Diffuse, subacute, general, spinal paralysis (Duchenne). </td> </tr> <tr> <td>Syringomyelia.</td> <td></td> </tr> <tr> <td>Multiple neuritis (amyotrophic form).</td> <td>{</td> </tr> <tr> <td></td> <td>{</td> <td> Lead paralysis.
 Leprous neuritis.
 Alcoholic neuritis. </td> </tr> </table> | Anterior poliomyelitis | { | | { | Infantile form.
Acute, of adults. Spinal paralysis, with rapid course and curable (Landouzy-Déjerine).
Subacute and chronic form.
Chronic mixed form (Erb). Diffuse, subacute, general, spinal paralysis (Duchenne). | Syringomyelia. | | Multiple neuritis (amyotrophic form). | { | | { | Lead paralysis.
Leprous neuritis.
Alcoholic neuritis. |
| Anterior poliomyelitis | { | | | | | | | | | | | | | |
| | { | Infantile form.
Acute, of adults. Spinal paralysis, with rapid course and curable (Landouzy-Déjerine).
Subacute and chronic form.
Chronic mixed form (Erb). Diffuse, subacute, general, spinal paralysis (Duchenne). | | | | | | | | | | | | |
| Syringomyelia. | | | | | | | | | | | | | | |
| Multiple neuritis (amyotrophic form). | { | | | | | | | | | | | | | |
| | { | Lead paralysis.
Leprous neuritis.
Alcoholic neuritis. | | | | | | | | | | | | |
| Facial hemiatrophy. | | | | | | | | | | | | | | |
| Muscular atrophy of cerebral origin . . . | { | With secondary degeneration involving the anterior cornua.
Without secondary degeneration involving the anterior cornua. | | | | | | | | | | | | |
| Muscular atrophy in hysteria. | | | | | | | | | | | | | | |
| Muscular atrophy from systemic disease of the cord. | { | Amytrophic lateral sclerosis.
Glosso-labio-laryngeal paralysis. | | | | | | | | | | | | |
| Atrophy complicating other diseases of the cord. | { | Atrophy in myelitis.
Atrophy in compression of the cord.
Atrophy in multiple sclerosis.
Atrophy in tabes dorsalis. | | | | | | | | | | | | |

The distinguishing features between spinal progressive muscular atrophy and the primary myopathies are held to be the want of heredity, the presence of bulbar paralysis, fibrillary twitchings, and degenerative reactions, the peculiar distribution in the former and pseudo-hypertrophy in the latter. The existence of atrophy of spinal origin beginning elsewhere than in the small muscles of the hand is still doubtful. The different types of the primary myopathies are believed to be merely different distributions or manifestations of one disease; the Charcot-Marie type, however, is still undetermined, but the writer regards it as probably myelopathic. Although he recognizes the affinities between amyotrophic lateral sclerosis, glosso-labio-laryngeal paralysis, and Aran-Duchenne's atrophy, he does not yet venture to group them as one disease. He recognizes only two forms of anterior poliomyelitis,—acute and chronic; the separate types given in the table can all be classed under these heads. He is inclined to Erb's hypothesis that in neuritis there is a dynamic change in the motor cells which gives rise to objective lesions in the peripheral nerves, and he goes farther in hinting at a similar dynamic change in the cells of the cortex, which gives rise to the objective lesions of amyotrophic lateral sclerosis. This same dynamic change is appealed to to explain the atrophies in tabes where peripheral neuritis has been found with no lesion of the anterior cornua. His main resource in treatment is by electricity,—galvanism to the spine and faradism to the muscles.

Raymond's work is the most complete monograph on muscular atrophy that has yet appeared, but he neglects some of the more recent work, and some of his conclusions are not wholly justifiable, as will be seen later.

Muscular Atrophy of Cerebral Origin.—The existence of atrophy in cerebral paralysis, even without changes in the anterior cornua, seems fairly well established. Borgherini has added further evidence in support of this, and Eisenlohr reports the existence of electrical changes of a character calculated to upset all our ideas as to the value of degenerative reaction as a localizing symptom.

Borgherini, ⁷⁵_{Sept 15} in a case of hemiplegia from sarcoma in the central convolutions, found marked atrophy of the arm and some atrophy of the whole side, the intensity of the atrophy corresponding to the severity of the paralysis. There were no marked

changes in the electrical excitability. The autopsy showed degeneration of the pyramidal tracts, with normal motor cells, nerves, and nerve end-plates, and atrophy of the muscles of a degenerative character. The atrophy began two months after paralysis, and the changes in the muscles were precisely the same as those seen in progressive spinal atrophy. Atrophy may arise from cortical and subcortical lesions. In the latter case Borgherini believes that the thalamus is apt to be involved, and he calls attention to the frequent co-existence of sensory disturbances in the cases with atrophy. Lesion of the motor tract alone, as in capsular lesions, is apparently unattended by atrophy. He suggests that trophic fibres, passing with sensory fibres from the cortical cells, may exert an influence on the motor cells of the anterior cornua; when this influence is cut off dynamic changes in the motor cells may cause muscular atrophy.

Eisenlohr⁷⁵_{Jan.1} reports 3 remarkable cases of cerebral paralysis where there was marked muscular atrophy. The first case was attacked suddenly in February, 1887, with right hemiplegia, hemianæsthesia, and aphasia. In April there was atrophy of the forearm and hand. In May electrical examination showed normal excitability of the nerves, but diminished excitability to faradism in the muscles of the hand, and slow reaction to galvanism with $\text{AnSZ} > \text{KaSZ}$. The autopsy in May showed abscess of the brain, secondary degeneration of the pyramidal tracts, but the anterior cornua absolutely normal. A second case showed similar atrophy and electrical changes, with the pyramidal tracts absolutely normal as well as the anterior cornua. In a third case under observation, with probable cerebral disease, similar electrical changes and atrophy have been observed.

Spinal Muscular Atrophy.—A portion of the literature of this subject has been discussed in the preceding section. The past year has brought comparatively little that is new, except in the way of discovery of anomalous forms and reports of cases that go to show that the sharp lines of distinction between the spinal and myopathic atrophies cannot be maintained.

Sachs⁴⁷_{Jan.} reports 2 new cases of the “leg-type” of progressive muscular atrophy,—the Charcot-Marie-Tooth type. The disease occurred in two brothers, and made its appearance at precisely the same age in both. “In both boys difficulty developed gradually in

the use of legs and feet, this difficulty increasing with the development of bilateral club-foot, in the one case leading to an absolute impossibility to walk without the use of crutches. The deformity of the feet was evidently due to a paresis and atrophy of the peronei, the anterior tibial, to a greater or less extent of the extensors of the feet and toes, and of the small muscles of the feet. This atrophy appears to have developed symmetrically in both legs and in an upward direction, effecting a weakness of the thigh-muscles as well as of the muscles of the legs. In the one case the atrophy did not extend beyond the hips; in the case of the younger brother we find a uniform wasting—or, at least, a uniform weakness—of most of the muscles of the upper extremities. In this younger boy the infra-spinatus also was affected. In both cases the knee-jerks were present. In the one case plantar reflexes were present, in the other absent. The sensory disturbances were not very marked; in the one case there was a slight hyperæsthesia, in the other a slight anæsthesia to pain. Vasomotor changes were noticeable in both cases, but no more marked than we are apt to find in cases of poliomyelitis. The electrical reactions show an approach to a complete reaction of degeneration in one case, and to a partial reaction of degeneration in the other, of most of the muscles of the lower extremities. The only other electrical phenomenon I was able to establish in these cases was a diminished faradic and galvanic excitability in the nerves of the upper extremity."

In cases of congenital bilateral club-foot this disease is to be suspected. Sachs thinks that the entire absence of hypertrophy and the presence of degenerative reaction in the early stage are of some value in evidence of a spinal origin, but he admits that proof can be obtained only from autopsies.

Donath ¹¹³_{Sept. 22, '89} reports a case of atrophy in a man of 23, involving one leg, especially below the knee. From the absence of heredity and the presence of fibrillary contractions and degenerative reaction, he believes it of spinal origin.

It seems probable that there is a "leg-type" of spinal atrophy, although there are as yet no absolutely pathognomonic signs of the spinal as distinct from the primarily muscular forms. Heredity, on which Raymond lays some stress, probably is a factor in some of the spinal cases. Bernhardt ⁴¹_{July 28} has recently reported the cases

of two cousins with atrophy beginning in the muscles of the shoulder and neck, with symptoms of bulbar paralysis. The mothers of the two patients, who were sisters, and another member of the family had a similar disease. Bulbar symptoms point, without much doubt, to a spinal origin, and muscular pseudo-hypertrophy to primary myopathy. Fibrillary contractions and degenerative reactions are probably more common in the spinal forms, but, as will be shown below, they are not always absent in the primary myopathies. Even the examination of bits of excised muscle gives no definite information. In the ANNUAL for 1890 considerable evidence on this point was brought forward. I have myself seen hypertrophied muscular fibres in the spinal form, and Borghe-
rini⁸⁴_{Dec.7,'89} has recently found them in atrophy following polioencephalitis as well as in myelopathies.

Shirtzing³²⁶_{V.45, Nos.3,4} reports 2 cases of congenital absence of the pectoralis, and compares them with cases of acquired atrophy of these muscles. The congenital form is usually unilateral. Fibrillary twitchings and degenerative reaction point to spinal or nerve disease. The congenital form shows trophic changes in the skin, and there is a surprising power of using the arms; while in the acquired forms, with marked atrophy, there is great disability. Engstud²⁰²_{June 10} has reported cases of acquired atrophy in threshing-machine feeders.

Cases of progressive spinal muscular atrophy, without special interest, are reported by Krejčí,⁸⁴⁴_{Apr.5} Bradfute,⁷⁶⁰_{June 21} Smith,⁶_{Dec.14,'89} Burgess,²_{Nov.30,'89} Kuckein,¹⁵⁰_{July} and Chabrely,¹⁸⁸_{Dec.8,'89} whose patient had also trophic disturbances of the nails.

Annequin²⁴³_{Apr.} reports a case of atrophy of one rhomboid, due, as he thinks, to a very limited anterior poliomyelitis. The paralysis is shown by a characteristic deviation of the scapula, the lower angle of which is carried away from the spine and projects a little backward. Other cases of localized atrophy are reported by Shertzer,¹⁶⁷_{Oct.} Bird,²⁸⁵_{July 15} and Fisher,²²²_{May}

Atrophy from Inanition.—Morpurgo⁴⁰⁹_{V.12, No.3} finds in starved animals that the cells of the liver, kidneys, and spleen, and the muscular fibres are enough, reduced in size, to account for the loss of bulk, but that the relative number of cells is unchanged.

Atrophy in Joint Disease.—Raymond⁹²_{May; June 7} advances a new explanation of these atrophies based on experimental investiga-

tions. The old theory of atrophy from disuse lacks support, and in his work on atrophies, just cited, Raymond argues against it, and supports provisionally the theory of an extension of inflammation to the muscles or nerves. Raymond now believes that the changes are of reflex origin. He injected an irritant into the knee-joint of several animals, and found that the following changes occurred: (1) Exaggeration of the knee-jerk; (2) increase of idio-muscular contractions; (3) increase of faradic excitability; (4) hyperæsthesia of the skin; last of all, muscular atrophy affecting mainly the extensor muscles. The peripheral nerves and spinal cord were perfectly normal when examined microscopically, and, although the individual muscular fibres were wasted, there was no inflammation or other change in the interstitial connective tissue. Raymond then performed the following experiment: He divided the posterior roots of the last four lumbar nerves on one side only, and injected an irritant into both knees. Both became inflamed, but atrophy occurred only on the side on which the posterior nerve-roots were intact. He considered that the wasting must be due to interference with the function of the cells in the anterior horns. Francesco⁵³⁷_{No. 12, 189} believes that a case of atrophic paralysis consecutive to articular alterations, which was carefully observed by him, was of parasitic origin.

Muscular Dystrophies.—After the exhaustive reports on this subject in the ANNUAL for 1889 and 1890, there is comparatively little in the literature of the past year that adds materially to our information. It is comparatively useless to speculate from the symptoms of a case, without autopsy, whether it should be regarded as myelopathic, neuropathic, or myopathic, and cases with autopsies are few and far between. As has already been said, the alleged distinctive symptoms between the three forms which Raymond dwells on are not absolute, although they enable us to make tolerably correct distinctions. Eisenlohr has reported the only case with autopsy—a young girl, with no heredity, who began at the age of 13 to have weakness in the back, shoulders, and arms, and later in the neck and legs. Since the age of 23 she had been bedridden. The face was rigid and mask-like, but single movements could be performed. There was marked atrophy of the neck, shoulder, and upper-arm muscles, and of the long supinators; the forearm muscles were somewhat wasted. Marked atrophy of the

back and leg muscles. No fibrillary contraction or pseudo-hypertrophy. Wide-spread, partial reaction of degeneration, but never the complete form. Repeated attacks of dyspnœa, in one of which she died, at the age of 26. The autopsy showed no changes in the nervous system and marked atrophy of the muscles, with fatty infiltration, but without any hypertrophy of the fibres.

When the various primary myopathies were first described there was a tendency to very minute analysis and a differentiation into numberless "types," which threatened to become as numerous as the recorded cases. At present most writers seem to agree in considering that all the "types" are substantially the same affection, the only subdivisions being pseudo-hypertrophy paralysis and primary dystrophy, and that even these two forms cannot be separated from each other by any absolute criterion. This is shown very convincingly by 2 cases reported by Sachs.⁹_{June 21} The first case was a young man of 20, with marked atrophy of most of the muscles of the chest, shoulder, and upper arm, thigh, and anterior leg, the orbicularis oris and orbicularis palpebrarum; and hypertrophy of the deltoids, infraspinata and supraspinata and calves, representing, therefore, pseudo-hypertrophic paralysis and the "types" of Erb and Landouzy-Déjerine in one patient. The second case had atrophy of the shoulders and upper arms, lordosis, and hypertrophy of the calves and glutei. In neither case were there fibrillary contractions or reaction of degeneration. The second case was also somewhat demented. Pilliet⁹²_{p.399} reports a similar case of an imbecile with atrophy in the arms and pseudo-hypertrophy in the legs. Dana⁵⁹_{Aug.23} has also reported a case of Erb's juvenile form of atrophy in a man of 40, beginning at the age of 17, with some pseudo-hypertrophy in the calves. Thérèse,¹⁰⁰_{Nov.15} moreover, emphasizes the fact that atrophy was found by Duchenne in some of the muscles in the earliest cases described by him, and claims that it is the rule; atrophy existing when the sclerosis advances faster than lipomatosis, and pseudo-hypertrophy when lipomatosis predominates.

Henoch,⁴_{Dec.21,'89} reporting a case of pseudo-hypertrophy, holds that there is a stage of muscular weakness before the pseudo-hypertrophy begins. In the discussion of his paper Meyer believed that pseudo-hypertrophy was sometimes preceded by true hypertrophy, as some of the muscles had to do the work of the muscles first affected. Walton and Cutler⁹⁹_{Nov.12} report a case of pseudo-hyper-

trophy, remarkable in that it did not begin until the age of 30. Upson¹_{Aug.23} reports a case associated with exophthalmic goitre. Two cases reported by Runeberg and Homen,²¹²_{Jan.} and 2 others by Coromilas,²⁴_{Mar.23} are not remarkable. Annequin²¹¹_{June 22,20} reports a case which hints at the possibility of hypertrophy of neurotic origin; a man, during convalescence from acute rheumatism, was attacked by sciatica, with sensory disturbances and reaction of degeneration. With this there was a pronounced enlargement of the leg, but no examination of the muscles was made to show whether it was a true hypertrophy.

Schultz⁴¹_{Feb.24} reports a case of hereditary dystrophy, with weakness of the extremities and atrophy of the upper arms and thighs, where the autopsy showed atrophy of the right lateral column, a spot of softening in the right anterior horn in the cervical region, and a diminished number of motor cells. He at first thought this might be a cause of the trouble, but later he came to the conclusion that it was only a coincidence.

Eisenlohr⁶⁹_{Jan.30} reports a case of Hoffmann's neurotic form of progressive atrophy which seems not unlike syringomyelia. The mother and a brother had similar trouble. The patient, at the age of 15, began to have weakness of the arms, followed by atrophy. Later there was severe pain in the legs. There was marked atrophy and paresis in the muscles of the shoulder, upper arm, thighs, and anterior tibials, with sensory disturbances, anæsthesia to touch, pain, and temperature.

Cases more or less closely resembling the facio-scapulo-humeral type of Landouzy-Déjerine are reported by Bielschowsky,⁷⁵_{Jan.1,15} Upson,¹_{Aug.23} Naunyn,⁸_{Nov.8,'89} and Eisenlohr.⁶⁹_{Jan.30} Thomson³⁶_{Mar.} reports a case of Erb's juvenile form. Dählhardt,⁷⁵_{Nov.15} maintaining that it is not always possible to make an exact differential diagnosis between myelopathic and myopathic atrophy, reports 2 cases in the same family, one closely resembling the Charcot-Marie-Tooth peroneal form, beginning in the legs and involving the hands later, with pain and diminished electrical reactions, but without reaction of degeneration or fibrillary contractions. A sister, aged 20, had atrophy of the Duchenne-Aran type, beginning in the hands, with fibrillary contractions. Dählhardt, from these and other cases, is inclined to believe that the myopathic atrophies are due to dynamic changes in the nervous system.

MYOSITIS.

Acute Polymyositis.—It is now about three years since Unverricht, Wagner, and Hepp reported cases of this rare affection, the cardinal symptoms of which are swelling of the extremities, partly from muscular swelling and partly from subcutaneous œdema, affection of the muscles of respiration and deglutition, with disturbances of their functions and an exanthema. Unverricht²¹_{Oct. 6} claims that the muscles of the eye and the tongue and the diaphragm are not involved, and reports a new case of a pregnant woman, where the skin affection, resembling urticaria, was much more marked than the affection of the muscles. The patient recovered. Löwenfeld³⁴_{Aug. 5, 12} reviews the subject, and reports a fatal case, without autopsy, in a man of 50, who was attacked, without apparent cause, with pain and swelling of various muscles, beginning in the calves. The inflammation was attended with a macular eruption of general distribution. The heart-muscles were probably involved, contrary to Unverricht's earlier *dictum*. The course of the disease was variable; the patient was apparently convalescing, the affected muscles showing considerable atrophy, when the disease started up again, after an attack of influenza, affecting the heart and the respiratory muscles. Löwenfeld believes that acute polymyositis is an infectious disease, sometimes attacking the muscles alone, and sometimes both the muscles and the nerves. Busch¹¹³_{June 22} reports a case of multiple acute purulent myositis, coming on in an adult after exposure and recovering on opening the abscesses.

Cases of inflammation of single muscles or groups of muscles are also reported,—one³⁶⁶_{Nov. 30, '80} of inflammation of the psoas, sartorius, and internal iliac, with fatal result, but without a complete autopsy to account for the source of inflammation; one of myositis of the brachialis anticus after injury to the elbow, reported by Trichet,²²⁰_{Aug. 22} and a case reported by Leidy,¹¹²_{May} of hemiglossitis.

NEURITIS.

Multiple Neuritis.—In the last ANNUAL the series of articles by Ross was referred to, and the chapters that had appeared were analyzed. The series is not yet complete, but chapters have appeared through the year⁹⁰_{Dec., '89; Jan. to Mar., Aug. to Nov.} that contain matter of great value, discussing subacute and chronic neuritis, alcoholic neuritis, neuritis

from carbonic-oxide poisoning, and diphtheritic neuritis. In the sensory disturbances of subacute neuritis Ross lays stress on the frequent occurrence of plantar neuritis, with sensory and vasomotor disorders, often presenting the picture of erythromelalgia and of extreme hyperæsthesia of the muscles. All forms of pain, paræsthesia, and anæsthesia may be present, but the muscular sense is rarely disturbed to any extent. Inco-ordination in the absence of paresis has not been observed. Cramps are common among the motor disturbances of the earlier stages. The knee-jerk is sometimes exaggerated in the early stages, and it may be exaggerated in all varieties of the disease; but it is usually lost early in the progress of the paralysis, and its absence is an important sign. The electrical reactions vary; we may find all forms of degenerative reactions up to the complete reaction of degeneration, but there



FIG. 1.—DOUBLE WRIST-DROP FROM A CASE OF ALCOHOLIC NEURITIS.

(*Medical Chronicle.*)

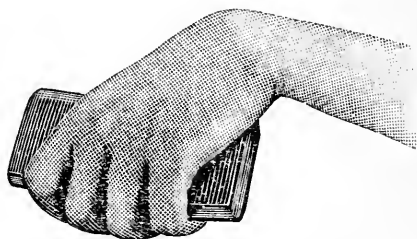


FIG. 2.—HAND FROM CASE OF SLIGHT DEGREE OF ALCOHOLIC NEURITIS, SHOWING PREDOMINANCE OF ACTION OF FLEXORS WHEN PATIENT GRASPS.

are undoubted cases of neuritis with normal galvanic reactions. The deformities from the paralysis and atrophy are described with much detail and care. The deformities from atrophy, although striking, need no special consideration, but the vicious attitudes imposed on the limbs by the unbalanced action of the unparalyzed muscles are of much importance. In all forms of peripheral neuritis the extensors are attacked in preference. This, in the upper extremity, leads to wrist-drop (Fig. 1), or, in the earlier stages, to a predominant action of the flexors, manifested on attempting to grasp an object (Fig. 2). The extensors, although not strong enough to prevent wrist-drop, nevertheless may, by their elasticity or by their remaining contractile power, manifest their action by keeping the phalanges extended, or even hyperextended, at the metacarpo-phalangeal joint and flexed at the other joints. The

flexors, however, undergo an adapted shortening, from the lack of apposition, so that when the arms hang down the hands may take the position shown in Fig. 3. When the triceps is involved and

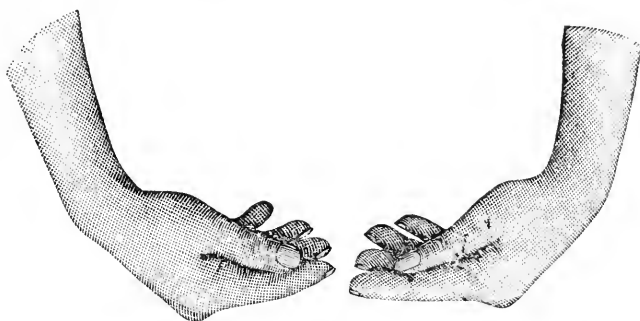


FIG. 3.

From a case of lead paralysis, in which the dropped hands were maintained in the supine position.
(*Medical Chronicle.*)

the patient is asked to raise the hand, a general action of the flexors ensues, giving the attitude shown in Fig. 4. The minor distortions



FIG. 4.

From a case of alcoholic paralysis.
(*Medical Chronicle.*)

caused by paralysis of the small muscles of the hand are of still greater importance in the diagnosis of the earlier stages of neuritis. Weakness of the *opponens pollicis* causes the thumb to be drawn

back toward the plane of the fingers (Fig. 5), while paresis of the extensor primi internodii causes adduction of the metacarpal (Fig. 6).



FIG. 5.

Showing metacarpal bone of thumb on nearly same plane as the corresponding bones of fingers, and slight flexion of the two phalanges of the thumb.
(*Medical Chronicle.*)

These distortions become most manifest in action, especially when the patient is made to touch the tips of the thumb and little finger,

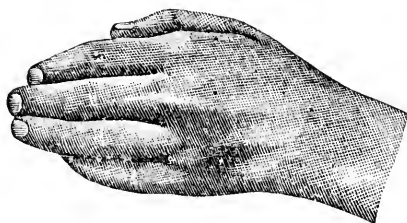


FIG. 6.

Showing adduction of metacarpal as well as slight flexion of thumb at both joints.
(*Medical Chronicle.*)

which cannot be done without flexion of their distal phalanges (Figs. 7 and 8).



FIG. 7.

Showing normal action of thumb and little finger.



FIG. 8.

Showing action of thumb and little finger when the flexor brevis and abductor and adductor pollicis and the opponens minimi digiti are feeble.
(*Medical Chronicle.*)

As the lower extremity is in many cases affected earlier, and more severely, similar changes may be noted there. The foot-drop

is familiar, but in the earlier stages of paralysis the toes are hyperextended at the metatarso-phalangeal joints and flexed at the

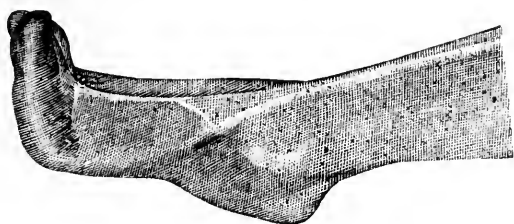


FIG. 9.

From a case of alcoholic paralysis, showing dorsum of foot on a plane nearly continuous with the anterior surface of the leg, and hyperextension of the big toe at both joints, and of the other toes at the metatarso-phalangeal joints, with flexion at the phalangeal joints.

(*Medical Chronicle.*)

phalangeal, except the big toe, which is extended at both joints (Fig. 9), the same as occurs in spastic paralysis; later, however,

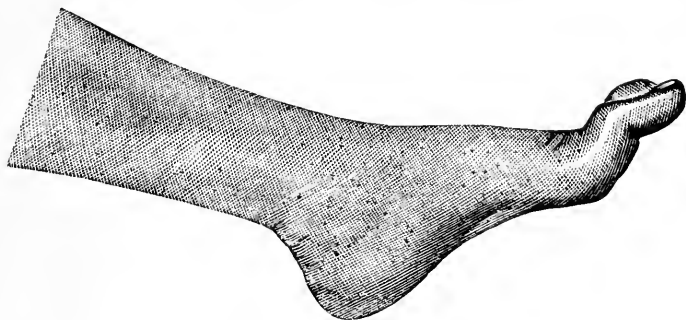


FIG. 10.

From a case of syphilitic multiple neuritis, showing hyperextension of big toe at metatarso phalangeal and flexion at the phalangeal joint.

(*Medical Chronicle.*)

the distal phalanx of the big toe becomes flexed (Fig. 10). In the third stage the big toe is flexed at all the joints, while the other

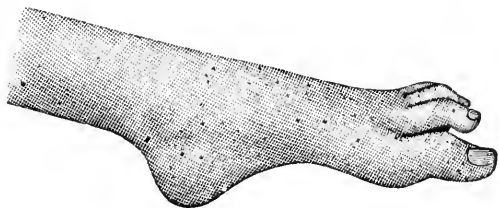


FIG. 11.

From a case of alcoholic neuritis, showing big toe becoming dropped at the metatarso-phalangeal joint, but the other toes still remaining hyperextended at the corresponding joints.

(*Medical Chronicle.*)

toes remain hyperextended (Fig. 11), and in the fourth stage (Fig. 12) all the toes are flexed. This leads to an increased concavity of

the foot while at rest, but an increased flatness on walking, so that the patient complains that he has lost his "spring" in walking. In bed the legs are often flexed and interlocked, with the feet in the position shown in Fig. 13. Various forms of scoliosis, kyphosis, and lordosis are also seen in advanced cases. Feebleness of the facial muscles gives rise to various changes in expression. Paralysis of the diaphragm and viscera, even of the bladder, is occasionally observed, but paralysis of the heart is of extreme importance. The earliest disturbance of gait consists in the loss of "spring" just mentioned; later the toes catch, and the knees must be raised higher to avoid obstacles which the dropped feet might catch,—the "high-stepping gait." Where the back, thigh, and calf muscles



FIG. 12.

From advanced alcoholic paralysis, showing ankle-drop and pendulous condition of the anterior part of foot, with flexion of the toes at all the joints.

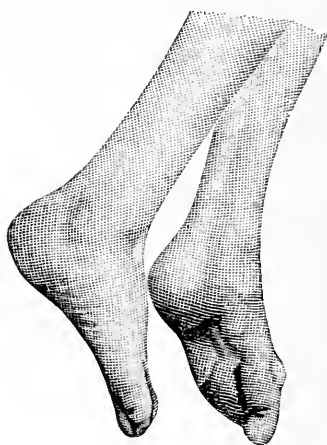


FIG. 13.

From a case of advanced alcoholic paralysis. The feet are shown as they lay flat on the bed; the right knee was uppermost and the leg slanted backward, so that the foot lay on the bed behind the left.

(*Medical Chronicle.*)

are also involved, the feet are kept wide apart, the gait is tottering, and the steps are short. Among the various vasomotor and trophic changes, such as "local asphyxia," "glossy skin," bed-sores, nutritive changes in the nails, and perforating ulcer, there are sometimes observed a hyperplasia of the subcutaneous tissue of the palm, which becomes flat and smooth, and also a swelling of the tendons at the wrist (tenositis hyperplastica). In the chronic forms of neuritis, which may last for years, where the patient is seen only in the late stages and gives no history of any cause, the diagnosis becomes extremely difficult.

Ross has analyzed 90 cases of alcoholic multiple neuritis. His

figures show only 41 cases in women, but, considering the greater rarity of alcoholic excess in women, and the fact that the worst cases occurred in women, he regards them as more susceptible to the disease. Beer-drinking, too, may produce the disease, just as do other forms of alcoholic excess. The symptoms of alcoholic neuritis do not differ materially from those of neuritis due to other causes, but the psychical disorders are much more prominent, and are discussed in detail in one chapter, and in another paper on the same subject,^{166 Apr.} embodying much of the matter of this chapter. These psychical disorders embrace four stages: "(1) a premonitory one, in which the special senses and imaginative faculties are liable to be exalted; (2) a stage of depression, or melancholia; (3) a transition stage of delirium, mania, or melancholia with excitement, or of convulsions passing on to (4) a final stage of dementia." The first stage is attended with hallucinations, a lowering of intellectual power, and a concentration of the thoughts on one or two great schemes of ambition or revenge. The exaltation may also manifest itself in outbursts of extravagant conduct, the whole condition resembling that of the early stage of general paralysis. Insomnia is a frequent symptom of the stage of depression, with restlessness, moroseness, irritability, and bad dreams; the patient becomes shy and timid, and unable to do anything without first steadying himself with alcohol. Delirium may be acute or chronic, the former being the familiar delirium tremens. The chronic form is marked by failure of memory and a peculiar disorder in the appreciation of time and place, with melancholia, hallucinations, and delusions of persecution. In the stage of dementia the mind becomes a blank with regard to dates and events, patients bed-ridden for weeks telling strange tales of walks and talks taken in the morning.

Two cases are given of neuritis from carbonic-oxide poisoning, one in a gas-maker, the other in a furnace-man, both exposed to fumes from a furnace; both were anæmic, the hæmoglobin was reduced, and at the onset of their trouble they suffered from pain in the hypochondrium, shortness of breath, and dyspnoea on exertion; in neither could any other cause for neuritis be detected. From a careful comparison with the reported cases Ross is therefore inclined to ascribe the neuritis to this cause. In these cases psychical disorders also occur: depression of spirits, apathy, and inability to

concentrate the thoughts on any subject; and in some cases there may be permanent mental impairment.

The articles on diphtheritic neuritis are, like the others, illustrated by the reports of cases. Although diphtheritic paralysis is apparently commoner in adults, yet the difficulty of detecting slight sensory or oculo-motor or motor disturbances in young children is so great that many cases in them are overlooked. Ross believes that 2 out of 3 children are later affected by paralysis, or, at least, that it is as common as in adults. Although paralysis has not always any relation to the severity of the diphtheria, still it seems pretty sure to follow cases where the membrane is dense and widely distributed. The connection between paralysis and albuminuria is uncertain; many cases with albuminuria have paralysis, but, by reason of the albuminuria, such cases stay under observation longer. In no case did the paralysis make its first appearance beyond the fourth week of the disease. The soft palate and the legs are first affected, distortions of the toes being among the first indications; here we see (1) hyperextension at the proximal and extension at the distal joint; (2) hyperextension at the proximal and flexion at the distal joint; (3) flexion at both joints. Next to these the eye-muscles are most commonly affected, shown either by paralysis of accommodation or by squint. Sensory disturbances are less common. The knee-jerks are usually lost early. The implication of the heart-muscles is too familiar to need special mention.

In an interesting discussion held by the physicians of the Charité in Berlin, ⁴_{July 14, 21} Bernhardt spoke of the psychical disturbances of neuritis, notably the loss of memory and the almost complete confusion as to the surroundings. Although many cases of alcoholic neuritis had a resemblance to tabes, yet in neuritis muscular weakness and psychical disturbances were among the early symptoms, while in tabes they usually developed late in the disease. In a few cases of tabes, too, the knee-jerk is retained on one or both sides, while in alcoholic neuritis he thinks it is usually lost early,—a view which seems hardly tenable considering the number of cases of alcoholic neuritis with retained knee-jerk. In many of these alcoholic cases he holds that the brain is also affected. In regard to the pathology of Landry's paralysis he is still in doubt, but some cases of multiple neuritis certainly closely resemble it, and he had observed, following influenza, several cases

of Landry's type, two of which he quoted, both vigorous young men suddenly attacked with paralysis of the limbs. The knee-jerks were retained; the electrical reactions were normal; there were no sensory disturbances, no ataxia, and no disturbance of the bladder or rectum. Both cases were slowly improving. He mentioned also a case of peroneus paralysis after delivery. In mercurial poisoning he held that there was only a segmental and periaxial degeneration of the nerve, and not a complete degeneration; hence we see tremor and weakness rather than pronounced symptoms of neuritis. Moeli spoke especially of the psychical disturbances, which are not always uniform and are similar to those seen in alcoholic subjects without neuritis. Sleeplessness, changes in sense-perception, hallucinations, sudden increase in potations, and suspicion are among the earlier symptoms, which are followed by conditions of confusion or anxiety and later by morbid ideas about the surroundings, by complete inability to recognize persons or places, and by entire indifference to the surroundings. The preliminary excitement and confusion in these cases may escape notice from its short duration. Remak said that there were also cases of alcoholic neuritis without psychical disturbances where atrophy was a marked feature. In some of the cases there was an extensor atrophy closely resembling that of spinal muscular atrophy, but in the spinal forms he believed the faradic excitability to be much longer retained. In cases where several nerves are affected we must recognize a circumscribed neuritis, with motor and sensory symptoms limited to certain nerve-tracts, and a more diffuse form, with loss of knee-jerks, electrical changes in non-paralyzed nerves, etc. We must admit, but the cause is still unknown, that in the various forms of so-called neuritis the clinical pictures may vary greatly, some cases showing sensory or ataxic symptoms without electrical changes. The distribution of paralyses, to which he had called attention some years before, was important in distinguishing between peripheral and spinal paralyses, and disproved Erb's hypothesis of dynamic changes in the spinal cells. Landry's paralysis he held to be distinct from neuritis from the absence of electrical changes, atrophy, and sensory disturbances. Oppenheim showed, however, that in some of the cases Remak cited the absence of electrical changes was not absolutely certain.

In a discussion at the Italian Congress of Internal Medicine,

Grocco³_{Oct.29} spoke of gastralgia and laryngeal spasm arising from neuritis of the laryngeal nerves, and also of œdema and anæmia as existing in neuritis, and also of severe attacks of pain resembling crises. Rummo held that all were of toxic origin, the poison being mineral or organic or resulting from a microbe.

Adamkiewicz⁴¹_{Aug.11} has described spindle-shaped, pointed cells, semicircular on section, with oval nuclei, lying between the medulla and Schwann's sheath in the nerves. Whenever the nerves degenerate these cells atrophy and disappear. Brissaud³_{July.30} has noted segmentation of myeline and other changes resembling neuritis in nerves whose functions were unimpaired. Déjerine, however, in the same discussion, argues that these are only segmentary changes, involving a part of the fibres, and have long been recognized; in such cases the axis-cylinder is still intact. Where many fibres are altered and the axis-cylinder is destroyed, the function is also affected.

Kahler¹¹³_{Feb.23, Mar.2, 9} has published an interesting clinical lecture which contains nothing especially new. In treatment he recommends salicylate of sodium, ergotine, and massage. Strümpell⁴¹_{Feb.10} reports a case of multiple neuritis with double facial paralysis and ataxia, the latter being due, as he thinks, to disease of the centripetal fibres in the peripheral nerves. Jendrassik⁷⁵_{Dec.15, '89} opposes this view on the ground that such fibres have never been demonstrated; that the ataxia in neuritis is not a true ataxia like that of tabes; and that, even if it were, we cannot say that in a general disease, due to a diffuse poison, the lesion is wholly circumscribed.

Papers on neuritis, containing interesting summaries of our present knowledge, have been published by Bridges,¹⁰⁶_{Jan.} Church,⁶¹_{Nov.1} and Wiltrout,¹⁶¹_{May} and cases are reported by Funkhauser⁹⁸_{July} and Holmer,⁷⁵_{July.1} the latter a fatal case. Two of Church's cases and Holmer's followed influenza. Rossbach³²⁶_{v.46, p.409} reports a case associated with probable urobilinuria.

Korsakow³⁶⁸_{v.21, p.609} speaks of the psychical disturbances in neuritis. They consist of irritability, errors as to time and place, and acute and almost complete amnesia for recent events with good memory for past events. Although common in alcoholic neuritis, these disturbances were also seen in other forms of neuritis following typhoid, tuberculosis, malaria, etc. Hence the name of polyneuritic psychosis, or toxæmic psychic cerebropathy, is suggested.

The cause may be acute or chronic, some cases going on to permanent dementia. Borschoff⁶⁸⁵_{June} reports a case due, probably, to malaria and cured by quinine.

Alcoholic Neuritis.—Thomsen³⁶⁸_{V.21,Nc.3} reports 3 interesting cases, with autopsies. The first case had tachycardia, left-sided ptosis, double abducens paresis, and nystagmus, with no changes to explain them in the medulla or roots of the cranial nerves. The second case was mistaken for tabes, owing to a girdle sensation, incontinence of urine, and absence of knee-jerks for six years, but the cord was healthy; here, too, there were no lesions to explain amblyopia, nystagmus, abducens paralysis, and tachycardia. The third case had also hæmorrhages in the vagus and oculo-motor nuclei, with ptosis, nystagmus, and tachycardia. In the autopsy of a fairly typical case by Lanz and Mamurowski,⁷⁵_{Nov.15} the degeneration of the peripheral nerves was most marked at the extremities, decreasing toward the cord; the myeline sheaths were broken up, the axis-cylinders had disappeared, and many Schwann's sheaths were empty. In some places the changes were segmentary. In the autopsy of a case reported by Schmidt¹⁵⁷_{Sept.} the most interesting point was that the gastrocnemius fibres were almost wholly replaced by fat, a few scattered fibres remaining, having, for the most part, lost their striation. Buzzard²_{June 21} gives an interesting summary of our knowledge with reports of cases of alcoholic neuritis and also of diabetic neuritis. In females he has often noted a suppression of the catamenia. He cites a case with scotoma, due, as he thinks, to periaxial neuritis. Suckling⁶_{Nov.23,'99} also reports a case with slight optic neuritis. Lovely²_{July 5} mentions as a curious symptom a heavy, "leathery" feeling of the skin of the abdomen. Other cases are reported by Robinson,⁶_{Mar.1} McDowall,¹⁶⁶_{Apr.} M'Phedran,³⁹_{Aug.1,Sept.1} and Ferguson.⁶¹_{Oct.25}

Arsenical Neuritis.—Alexander,⁸⁰_{Jan.} studying the production of arsenical paralysis experimentally, comes to the following conclusions: 1. That the symptoms in cases of arsenical poisoning in man point to the fact that the symptoms are attributable to the action of the poison on the peripheral nerves and muscles, and are due to the production of multiple neuritis. 2. It is possible in rabbits, in certain instances, to produce permanent paralysis with arsenic, which is located especially in the posterior limbs, and is accompanied by a high degree of atrophy

of the muscles. 3. In paralyzed animals degenerated and atrophied nerve-fibres are to be found in the small muscular nerve-branches and in the nerves of the subcutaneous connective tissue, accompanied by swelling of and hæmorrhage into the perineurium. The spinal cord of animals so paralyzed is perfectly normal. 4. Paralysis in these animals, therefore, is dependent upon degeneration and atrophy of the peripheral nerves and muscles. 5. Experimental observations seem to warrant the assumption that arsenical paralysis in man is similarly produced. 6. The muscular atrophy created in animals poisoned with arsenic is not of neurotic origin, but is entirely independent of the nervous system. 7. The muscular atrophy in animals poisoned by arsenic, in the case of rabbits, is not a fatty degeneration, but a coagulation necrosis, which is ordinarily accompanied by the formation of calcareous deposits. 8. Degeneration of nerves and muscles is, in all cases of paralysis occurring in animals poisoned with arsenic, probably due to the production of disturbed action in the capillaries of the nerves and muscles.

Lambl⁶⁹_{May 8} reports an interesting case of neuritis, with pains in the extremities, numbness, fatigue, increasing to paresis, and then to atrophic paralysis, with partial reaction of degeneration, loss of tactile sensibility, hyperalgesia, pain on pressure over the muscles, increased mechanical insensibility, loss of tendon reflexes, and vasomotor disturbances. These symptoms developed after a probable attempt at poisoning by arsenic. There was almost complete recovery from the neuritis, but glycosuria also appeared, leading to diabetes. This was also ascribed to the arsenic. Stark⁵⁹_{June 21} also reports a case of neuritis following a single dose of Paris green taken with suicidal intent. Other cases are reported by Cutler⁹⁹_{Nov. 13}, Barton⁶_{July 19}, M'Phedran³⁹_{Jan. 1} and Ferguson⁶¹_{Oct. 25} the first two showing the importance of testing the urine for arsenic in suspected cases.

Cancerous Neuritis.—Auché⁹²_{Oct. 10} has found the changes of neuritis in 9 cases out of 10 of cancer. The only uniform cause seemed to be the presence of cancer, and he is inclined to ascribe the neuritis to the consequent cachexia.

Neuritis from Bisulphide-of-Carbon Poisoning.—Edge⁶_{Dec. 7, '90} describes the case of a rubber-worker, who had headache, delirium, hallucinations, vertigo, pain and numbness in the legs, paresis of the legs with foot-drop, anæsthesia, loss of knee-jerk, and reaction

of degeneration. He recovered rapidly on removal from the exposure, which leads Edge to think that there was more probably a lowered nutrition in the nerves rather than an actual degeneration.

Neuritis from Carbonic-Oxide Poisoning.—Ross's cases have already been cited. Bouloche⁹⁴_{Sept.} also gives an interesting account of the symptoms. He says that various paralyses are common, either scattered about in various muscles or existing as monoplegia or hemiplegia. The extensors of the fingers and toes are most frequently affected, and hemiplegia is by no means uncommon. There may be anæsthesia over the paralyzed muscles, or this may occur independently of paralysis, either limited to a definite nerve distribution or irregularly distributed. Disorders of nutrition are common; that most often seen is for the affected part to swell with a kind of hard œdema and to become of a reddish-blue color. Most patients get well, and there is, from the few post-mortem examinations which have taken place, no sufficient ground for a pathological basis.

Neuritis from Lead Poisoning.—Walton⁹⁹_{Oct. 30} reports a fatal case where the chief symptoms were a feeling of numbness and unsteady gait, and some loss of muscular sense. Lead was found in the urine, and the patient was given iodide of potassium; but he grew worse, became helpless, and died. There was no autopsy. Walton calls attention to the possibility, already recognized by a few writers, that ataxia may be due to lead poisoning. Mme. Déjerine-Klumpke¹⁰³⁶ devotes a considerable part of her thesis on neuritis to lead poisoning. She recognizes general and localized forms. The generalized forms may be of slow or rapid progress or may be attended with fever. The localized forms may be of (1) the *anti-brachial*, or extensor type; (2) the *upper brachial* type, as in Erb's shoulder-upper-arm paralysis; (3) the *Aran-Duchenne*, or thenar type; (4) the *peroneal* type; (5) *laryngeal paralyses*. In her opinion, Oppenheim's case is the only one pointing to a spinal origin.

Mercurial Neuritis.—Clarke²⁴²_{Feb.} reports a case of tremor and slight anæsthesia in a hat-maker who used mercury, and Forestier³¹_{May 21} reports a case of motor neuritis, without sensory symptoms, due, possibly, to mercury, but, perhaps, to syphilis.

Syphilitic Neuritis.—Taylor¹_{July 5} reports 2 cases of syphilitic neuritis. The first case had a slowly-progressing analgesia and anæsthesia of the extremities, with some pain in the legs, but no

special paresis. Later the extremities ulcerated and amputation became necessary. The second case was localized in the sciatic and attended with gummatous infiltration. Fordyce⁹⁹ July 10 also reported 2 cases, 1 involving the facial nerve, the other the legs.

Duménil²⁰³ Aug. 1, 15 reports a case of neuritis following septicæmia, and Fazio⁸ Dec. 12, '89 one following typhoid.

Local Neuritis.—Leszynsky²⁴² Jan. has published a very careful study of a case of neuritis of the brachial plexus. A man 38 years of age, shortly after exposure to cold (without antecedent history of joint disease or injury), suffered from severe paroxysmal pain in the left shoulder, rapidly followed by paralysis of the deltoid. After short but varying intervals of freedom from acute pain, another paroxysm would occur, accompanied by additional paralyses. These attacks, extending over a period of four weeks, involved all of the muscles innervated by the circumflex, supra-scapular, subscapular, musculo-cutaneous, and radial nerves. There was anæsthesia in the domain of the circumflex, external cutaneous and radial nerves. Well-marked atrophy, with the reaction of degeneration, existed in all of the paralyzed muscles. Trophic changes were present in the skin over the thumb and index finger. *The median and ulnar nerves were not implicated.* Almost complete recovery took place at the end of two years. It is well known that motor function is always more easily abolished than sensory function, and that in cases of recovery from damage sensation invariably returns before motion. In this instance the area of anæsthesia began to diminish after four months. At the end of one year all disturbance of sensibility had disappeared. The return of motility took place in the following order, the muscles attacked last being the first to recover: 1. Biceps group. 2. Subscapularis and teres major. 3. Triceps. 4. Supraspinatus, infraspinatus, teres minor, deltoid. 5. Extensors and supinators of forearm. The electrical resistance of the paralyzed arm was increased. Leszynsky thinks the lesion involved the anterior roots of the fifth, sixth, and seventh cervical nerves, but, as the median nerve was intact, he believes that there must have been anomalous origin for that nerve. Ferguson⁹⁸ Oct. reports a case of intense paroxysmal abdominal pain, following influenza, where there was neuritis of the visceral nerves throughout the abdomen. Sosa⁷⁹² Jan. 13 reports the case of a neurotic child attacked with hiccough, hysterical convulsions,

hallucinations, variable respiration, and irregular pulse. Pressure over the left phrenic caused great pain and a hysterical seizure. A diagnosis of neuritis of the phrenic was made, and iodide of potassium given with good results. Hodgen⁸²⁰_{Dec. 21, '89} describes a special brace to hold the scapula in place when paralyzed.

Apoplectic Neuritis.—Dubois²¹⁴_{Jan. 1} reports a case where a man suddenly lost power in the arm and at the same time had severe pain. The paralysis was limited to the muscles supplied by the median, radial, ulnar, and musculo-cutaneous nerves; there were also corresponding sensory and vasomotor disturbances, reaction of degeneration, and nerve tenderness. Déjerine³_{July 23} reports the autopsy of a similar case, first reported by Mme. Déjerine-Klumpke. There was a sudden paralysis of the arm, with the symptoms of neuritis. The sensory disturbances passed off, leaving an atrophic paralysis similar to an acute spinal paralysis of adults. The patient died of phthisis. The autopsy showed the cord and the nerve-roots healthy, and old neuritis, in process of recovery, in the peripheral nerves.

LOCAL PARALYSES.

Hutchinson⁸⁰⁶_{Apr., July, Aug.} mentions several cases of paralysis of the third and fifth nerves, one or two of them showing rapid recovery, and also cases of temporary numbness and local neuritis. Ziehl³¹⁹_{Nov. 23, '89} reports a case of isolated paralysis of the third branch of the trigemini, discusses the views concerning the course of taste-fibres, and comes to the following conclusions: 1. The nerve of taste for the anterior two-thirds of the tongue is the lingual. 2. The further course of the taste-fibres is as follows: chorda tympani, facial as far as the region of the geniculate ganglion, small superficial petrosal, or tympanic plexus, otic ganglion, back to the third branch of the fifth. (The path from the geniculate ganglion to the otic ganglion is hypothetical.) 3. Other paths which have been suggested, as the passage of the gustatory fibres to the second branch of the fifth, are not proven. 4. The glosso-pharyngeal is the nerve of taste for the posterior part of the tongue. 5. The nerve of sensation for the whole tongue is the lingual. Brower⁹_{Dec. 21, '89} also observed a case of facial paralysis associated with paralysis of the trigeminal nerve.

Facial Paralysis.—Lawson²_{Nov. 18} reports a case of probable hysterical facial paralysis, and Chautemesse⁶_{Nov. 1} 3 cases of the same

affection, which, he holds, usually involves only the inferior division of the nerve, and is associated with anæsthesia in that region. Picot⁷⁰_{Nov.16} discusses facial paralysis from lesions of the pons. In the first class of cases the lower division only of the facial is involved, and these cases are usually complicated with bulbar symptoms. In the second class both divisions of the facial are involved, and these are usually complicated with oculo-motor symptoms. In the second class of cases there may also be hemiplegia, either direct or crossed.

Other cases of facial paralysis are reported by Althaus,²_{May 17} Lyman,⁹_{Dec.28,'89} Watson,⁶_{Mar.22} Barr,¹⁸⁷_{July} M'Phedran,³⁹_{Aug.16} Herman,⁶⁵_{Mar.} Bonnefin,¹⁵²_{Dec.19,'89} Koch,⁷⁵_{July 1} Runeberg,⁷⁵_{Feb.16} the latter case being associated with hysteria, and Pritchard,⁴³_{Nov.} whose patient had also paralysis of the fifth nerve.

Shapringer²⁴²_{Mar.} describes the case of a girl 8 years of age, with congenital paralysis of both facial nerves and inability to turn the eyeballs either to the right or the left. For this last symptom he proposes the term "bilateral pleuroplegia." There were various anomalies of development in the child, and the symptoms were considered due to a lack of development of the brain involving the nuclei of the fifth, sixth, seventh, and twelfth nerves. Bernhardt⁷⁵_{July 16} reports a similar case. Nieden¹³_{Sept.16} reports a case of periodical paralysis of the facial and abducens.

Dubois-Havenith²⁷⁶_{Aug.20} reports a case of paralysis of one-half the tongue resembling hemiatrophy and of hysterical origin. Heymann³¹⁹_{Dec.14,'89} reports 2 cases of paralysis of the crico-thyroid muscles. In the first case the important symptoms were defective tension of the vocal cords, the relation of the cricoid and thyroid cartilages being unchanged on intonation and the vocal processes disappearing on intonation. There was also anæsthesia of the mucous membrane. The trouble was supposed to be due to a neuritis of the superior laryngeal nerves. The second case was unilateral, and was marked by immobility of the left arytenoid cartilage, and the left vocal cord was in position of deep inspiration. Koller,¹⁵⁰_{Jan.} in a case of paralysis of the cervical sympathetic, observed that there was some ptosis; the eye was freely movable, but appeared sunken, and the pupil was very small. The latter reacted well; the visual power was unaffected. Koller contrasts this with the symptoms produced in the normal eye by the action of cocaine,

and succeeded in causing a temporary disappearance of the symptoms by the use of cocaine.

Cases of paralysis of one or more nerves of the arm are reported by Meunier,⁵⁷⁷ Sperling,⁷⁵ Bunting,²⁴² Bradshaw,² Stimson,¹ Liégeois,¹⁰⁰ Luzet,¹¹⁸ and Bruns.⁷⁵ Niessen⁶⁹ details several cases of paralysis and contracture with sensory disturbances due to ischæmia after bandaging. Popper⁶⁹ had a case of peroneus paralysis in a patient with an abscess which was opened near the knee, the nerve not being injured by the incision, but being compressed by a band of connective tissue.

BERIBERI.

The cause of beriberi appears to be still in doubt. Many observers ascribe it to a micrococcus, some to an intestinal parasite. Some think eating diseased fish is a cause; others ascribe it to diseased rice. Thomas³⁶ holds that the proximate cause is the presence of ankylostoma duodenale. He divides the disease into three forms: 1. Acute, with pyrexia, anæmia, anasarca, serous effusions, paralysis, and dyspnœa. 2. Subacute, with pain, atrophic paralysis, anæsthesia, loss of knee-jerk, mental debility, and œdema. 3. Chronic, with prostration, anæmia, œdema, and cardiac dilatation. Giles²³⁹ has investigated beriberi and kala azar in Assam, and holds both are due to an intestinal worm,—sclerostomum tetracanthum, the so-called beriberi dochmius. The young worms are found on plants and are eaten by horses, producing a disease called surra. The most prominent symptom in all three of these diseases is bloodlessness, and Giles regards them as identical and due to the presence of this worm, which sucks blood from the intestines in the same fashion as the ankylostomum. Sensino⁶ combats this view with much force. Ankylostomiasis is common in countries (as Italy) where beriberi is not found. Ankylostomum, filaria sanguinis, or trichocephalus dispar may be present in beriberi, but they are co-incidents and not a cause. Ankylostomiasis has symptoms not at all like beriberi. Fiebig¹³ criticises the accuracy of previous observations, and believes in a mixed infection whose agents are not easy to discover; the disease is not due to a primary degenerative neuritis. Mendes⁴¹ also thinks the various bacteria discovered have no causal relation to the disease, and that its special seat is in the cord. Rebougeon³ claims that

the disease is due to a micrococcus occupying the lumbar region of the cord, and also that he has produced the disease by inoculating animals with cultures of these micrococci. Grimm⁶⁹_{Oct. 23} has made a careful statistical study of an outbreak of kak-ke (beriberi) in Sapporo. The cause is still uncertain,—whether due to poison, animal parasites, or bacteria. Against the fish theory he argues that the aboriginal Aino, a great fish-eater, is very rarely attacked. Miura,²⁰_{v. 119} however, ascribes it to eating diseased tunny-fish, and states that it was common in the Japanese navy until fish was abolished from the diet, and that vegetable-eating prisoners were also exempt. The diminution of the disease in the Japanese navy since the change of diet, in 1884, is certainly remarkable. In 1882, out of a force of 4769 men 1929 were attacked; in 1883, out of 5346, 1236; since then the frequency has diminished, so that in 1887 and 1888 there were no cases and in 1889 only 3 men out of 8954 were attacked. Takaki²⁰⁰_{Oct. 25} thinks that rice-eating has weight in the etiology; in 1889 rice was dear, and more wheat and beans were eaten. Azevedo,⁴¹_{Aug. 25} noting the rapid spread in Brazil, also holds that rice is the cause. Eyre²_{May 24} and Harada²⁰⁰_{June} describe the symptoms without dwelling on the etiology. Putnam²⁴²_{Aug.} describes cases occurring in sailors, with symptoms closely resembling neuritis and akin to beriberi. In some of his cases the food was poor, and most of them were fishermen handling fish. From data obtained from the fishing-towns of Massachusetts, he thinks that in 1881 and 1889 there were epidemics of this disease, characterized by pain, loss of power in the legs, numbness, and œdema. Birge⁹⁹_{Nov. 13} describes cases seen in returning fishermen, at Provincetown, Mass., which he believes to be beriberi. They had œdema, shortness of breath, pains in the legs, and numbness and paresis of the legs; one had also hydrothorax and died of pulmonary œdema.

LANDRY'S PARALYSIS.

In last year's ANNUAL Ross's elaborate analysis of 93 cases were cited, and reference was made to his conclusions that the reported cases of Landry's paralysis were due to multiple neuritis. Nauwerck and Barth²⁵_{Jan.} report an interesting case substantiating this view. There was severe motor paralysis, beginning in the legs and ascending to the arms, without atrophy or electrical changes. The sensory disturbances were very slight and the reflexes remained

normal. The patient died of acute bulbar paralysis. Examination of the spinal cord and medulla was entirely negative, but the nerves of the cauda equina showed interstitial neuritis to a marked degree, with pronounced disappearance of nerve-fibres. The sciatic nerves participated, though to a less extent. In the lumbar region the anterior and posterior roots showed neuritic changes, which were also present, though in a less degree, in the roots of the dorsal and cervical regions. The roots of the bulbar nerves, also the nerves of the upper arm, were not apparently affected. The paralyzed muscles showed nothing abnormal on section. The authors consider the disease due to some toxic influence, and hold to the belief that Landry's paralysis is a form of multiple neuritis.

Eisenlohr, ⁵⁹_{Sept. 18} in 2 rapidly fatal cases, found wide-spread changes in the nerves throughout their whole extent. In one case, however, there were also extensive myclitic changes. He found micro-organisms of different forms in the central nervous systems and in the peripheral nerves, but he considers that these are not constant and may be absent. He also holds that the spinal cord may be alone affected.

Centanni ³¹⁹_{Nov. 13, '89} has made an anatomical examination of a typical case of Landry's paralysis, and has found the lesion to be an acute interstitial neuritis, with some tendency to affect the spinal cord indirectly. He further found a peculiar bacillus, in almost all the peripheral nerves, which was located almost exclusively in the endo-neural lymph-spaces. Lewis, ²³¹_{July} however, failed to find any bacilli in inoculations which he made from a fatal case.

Sanger Brown ⁴⁷_{Nov.} reports an interesting case which recovered. From the symptoms he considers the disturbance to be chiefly in the lumbar and cervical enlargements of the cord. The patient had exaggerated reflexes and the latter symptoms were associated with ataxic paraplegia. The sensibility to touch and temperature were distinctly diminished. Carter, ²_{May 17} reporting a case which made a perfect recovery, calls attention again to the theory that Landry's paralysis is due to a chill, which gives rise to an effusion of fluid in the central canal of the spinal cord, the fluid rising higher and higher, causing most pressure where the column of it is deepest and heaviest; that is, from below upward. This theory receives some slight support from the resemblance of the symptoms in Brown's case with those of some cases of syringomyelia.

Blomfield¹³¹_{Jan.} reports a case with symptoms resembling neuritis and associated with diabetes. Other cases are reported by Preston,⁹⁸_{July} Oppenheim,¹⁵_{Aug.} Lorentzen,³⁷⁵_{v.17,p.597} and Crago.²⁶⁷_{Oct.}

PARROT'S DISEASE.

Comby¹⁵²_{June 27} reports 2 cases of this rare disease, a pseudo-paralysis caused by an alteration in the osseous system in newborn children affected by hereditary syphilis. The affected limb was motionless, the epiphysis of the bone presenting a considerable swelling without participation of the surrounding tissue and without inflammation. Both cases recovered under mercury.

TROPHONEUROSES.

Scheiber¹¹³_{July 6} discusses various forms of trophoneuroses. He follows Samuel in dividing them into three groups: atrophies, hypertrophies, and dystrophies. In the latter group he reckons the inflammations and gangrenes of nervous origin. He describes 3 cases, one of acute tabes, where there was atrophy of the left side of the face and the right side of the thorax; a second case where there were various cutaneous disturbances, such as pemphigus and eczema of the face following facial neuralgia; and a third case which was an exceedingly complicated one of left hemiparesis and hemianæsthesia, paraplegia, atrophy of the skin, pains, and disturbances of respiration; there were also local asphyxia of the feet and various other vasomotor disturbances. Rosenbach⁶⁸_{Aug.} describes a very curious swelling of the fingers, probably of trophic character. It consisted of a tubercular swelling of the terminal phalanges on their dorsal surfaces and encircling the joints something like a ring. These swellings were seen chiefly in the ulnar distribution of the hand and were exceedingly sensitive to pressure. (Fig. 14.)

Köbner⁷⁵_{Mar. 1} describes a curious trophic disturbance of the skin somewhat similar to herpes, due to the application of electricity, lying in the course of the current, but not in any portion of the skin which had been touched by the electrodes. Paschalis⁵²⁰_{No. 30} reports the case of an hysterical woman, who, after consulting a fortune-teller who had prophesied misfortune if she went to a certain town, began to complain soon after her arrival of severe pain in the arm, and the whole forearm became blue, swollen, and

cold. The symptoms disappeared as soon as she left the town, but recurred on her return.

Erythromelalgia.—Auché and Lespinasse⁹²_{Dec., '89} report a case of this curious disease in a man of 30, coming on after exposure to the extreme heat of a furnace. The hands became exceedingly hot, congested, and intensely painful. Heat, exercise, excitement, and the dependent position increased the symptoms. Seymour⁵⁹_{June 7} reports a similar case in a neurasthenic woman, occurring only in one foot, and rendered worse by heat and the dependent position.



FIG. 14.—TROPHIC DISTURBANCE OF THE TERMINAL PHALANGES.
(*Centralblatt für Nervenheilkunde.*)

Raynaud's Disease.—Last year's ANNUAL gave a brief consideration of this subject, and reference was made to the elaborate papers by Ross, who classes this disease as one of the forms of peripheral neuritis. Hutchinson⁸⁰⁶_{Jan.} discusses certain disorders akin to Raynaud's disease. He holds that gangrene occurs in only a very small minority of cases, and includes under the term of "Raynaud's disease" all forms of liability to recurring derangements of the circulation in the extremities, which are marked by defective arterial supply. He still insists upon a symmetrical

development of the essential symptoms as a feature implying that the conditions produced depend upon general or central and not upon local causes. In the beginning he considers the disease as functional, but in the latter stages changes may occur in the nerves. In his examples of allied conditions he cites a case of "dead nose" in a young woman who was subject to painful attacks of coldness and lividity of the nose; a case of severe summer prurigo, affecting only the exposed parts; a case of erythema of the face and hands, invariably produced by exposure to the sun's rays; 2 cases of fissures in the skin; and a case of ulcerated blains in both ears. Taylor²⁴⁵_{Oct.} reports 2 cases, 1 of acute symmetrical gangrene, the other of a more chronic ulceration of the fingers and toes. Grant¹⁰⁰⁰ considers that, although the existence of neuritis has an important bearing upon the pathology of the affection, it is not a necessary cause of the gangrene; that the arrest of circulation is sufficient to account for the gangrene without invoking the aid of a nerve-lesion; that neuritis is very common where Raynaud's disease is rare, and that motor symptoms are generally present in neuritis but absent in Raynaud's disease; that the sensory symptoms are obviously due to the vascular disturbance; neuritis cannot account for the paroxysmal type of the disease; and the occasional association of transitory symptoms—aphasia, glycosuria, hæmaturia, blindness, and deafness—are entirely consistent with the theory of a central vasomotor disturbance.

Garland⁶¹_{Dec.14, '99} describes the various stages of the disease: the first stage, of local syncope, where the extremities turn to a waxy, cadaverous color, familiarly termed "dead fingers"; the second stage, of local asphyxia,—recurrent paroxysmal attacks of blueness; and, finally, the stage of symmetrical gangrene, describing cases of each sort.

Urbantschitch⁸_{June 5} reports a case affecting the upper parts of both ears. Cases are also reported by Bauer,⁷⁸⁵_{Jan} Calwell,²_{June 28} Humphreys,²_{Nov. 22} Villard,²¹¹_{Oct. 12} Cheadle,²_{Jan 4} Colman and Taylor⁶_{May 4} had a case in a child of 10, affecting usually the fingers of the right hand only, and not going beyond the ischæmic state. They found various changes in the blood—crenation and breaking down of blood-corpuscles and coloration of the liquor sanguinis.

Fell⁵⁵⁷_{July} describes a case, which presented certain curious resemblances to Raynaud's disease, of a man who was always anæmic,

with cold extremities and a very slow pulse; his face resembled that of a corpse. On various occasions he had attacks which rendered him almost lifeless, unable to stir from the bed, the only method of keeping up circulation being by friction, hot bottles, and brandy. In the course of an hour he would recover enough to move about, but was neverable to do active work.

Facial Hemiatrophy.—Homén⁷⁵_{July 1} reports a case of this curious affection, with autopsy. The affection began with severe pain in the left upper jaw and a hardening just behind the angle of the left lower jaw, which increased to a tumor the size of a hen's egg. There was anæsthesia of the whole left side of the face, with some weakness in the movements of the left eye; there was also atrophy of one-half of the tongue, and the whole left side of the face was sunken and atrophic. In the left middle fossa of the skull there was an endothelial tumor, which pressed upon the Gasserian ganglion and the branches of the left fifth nerve, but the seventh nerve did not differ materially from the nerve on the other side. There was a simple atrophy in the muscles supplied by the seventh nerve, and a marked degenerative atrophy of the muscles supplied by the fifth; there was no material difference in the number of cells in the substantia ferruginea on the two sides, but there was a distinct difference in the character of the cells, in the number of processes, etc., and the nuclei of the fifth nerve on the left was lighter in color, and there were also similar changes in the character of the cells. Bekhtereff⁷⁴⁸_{V.1,p.228,'88} reports the fifth Russian case of facial hemiatrophy, with an abstract of the 4 preceding Russian cases. His case occurred in a child of 4, coming on at the age of 1 year, after an intense fright. The left cheek was flattened and covered with deep wrinkles and grooves. The region corresponding to the upper jaw was flattened, somewhat depressed, the skin near it being thin, smooth, tightly stretched, and bluish, and the bone was atrophied. The electrical reaction of the muscles in this region was distinctly weakened, but the sensibility was intact; there was also atrophy of the tongue. Bekhtereff holds to the theory that facial hemiatrophy is due to an interstitial neuritis.

Sachs⁵⁹_{Mar.15} reports a case of hemiatrophy associated with clonic and tonic contractions of the temporal and masseter muscles, the contractions being most apt to follow excitement or exposure to

cold. Sachs holds that in some cases both the trigeminus and the sympathetic nerves are involved. He believes, however, that the disease is due primarily to an affection of the trophic fibres in the trigeminal nerves, but that subsequently it may involve the sensory or even, as in his case, the motor fibres. He has collected 97 cases of the affection. Steinert¹⁰³⁷ holds that in many cases we

are justified in assuming a lesion of the sympathetic, but undoubtedly, in the majority of cases, the fundamental lesion is in the trophic fibres of the trigeminus. The old hypothesis of a primary idiopathic disease of the subcutaneous tissue he holds to be untenable.

Gosset⁵⁷⁷_{Sept.} reports a case which he was fortunate enough to see in its very early stages, the only atrophy being in the form of a furrow in the forehead just to one side of the median line. Other cases are also reported by BlumenEAU⁵⁹⁰_{V.7, No.1} and Dreyer.³⁷³_{No.5}

Trevelyan⁴⁷_{p.1} found in a case of atrophy of a half of the tongue pronounced caries of the occiput and



FIG. 15.—HYPERTROPHY OF THE LEFT SIDE.
(*Münchener Med. Wochenschrift.*)

atlas, with some thickening of the membranes at the base of the brain and atrophy of the left hypoglossal nerve. Henshaw²⁴²_{Jan.} and Mauriac⁴⁷⁹_{Mar.} also report cases of hemiatrophy of the tongue.

Hypertrophy.—Möbius³⁴_{Nov.4} gives a further account of a case of hemiatrophy which he reported in 1885. He has now found that the patient, a boy of 14, instead of coming from healthy ancestors, had a distinct neurotic taint. The hypertrophy affected the left side, and careful measurements for the last eleven years are given,

showing that the difference in the two sides has remained practically the same. He excludes any vascular or nervous change as the primary cause, but considers that the hypertrophy is a morbid process, as it is attended by pains in the hypertrophied arm (Fig. 15). Kiwull⁵⁴_{Feb.15} describes a case of congenital hypertrophy of one side of the face, which attained enormous dimensions, and was due to an increase of the fat and connective tissue, as shown by examination of the part of the hypertrophy which was removed by surgical interference (Fig. 16). Redard³⁶⁰_{June} reports 2 cases of congenital hypertrophy,—one affecting the entire right half of the body, the other the right lower extremity. The fatty tissue was apparently the most involved. The temperature on the hypertrophied side was much higher in both cases, reaching 4° C. (39° F.). He enumerates the various theories advanced to explain lateral hypertrophy,—the nervous theory, the vascular theory, and the lymphatic theory. He believes the trouble is due to an alteration in the lymphatic system. The treatment employed was elastic compression, which gave very encouraging results.



FIG. 16.—CONGENITAL HYPERTROPHY OF ONE SIDE OF THE FACE.
(*Fortschritte der Medicin.*)

ACROMEGALY.

In last year's ANNUAL a very full account was given of an exhaustive research in this new and strange disease, made by Marie, who is still investigating the subject. In the last year many valuable observations have been made, giving further light on the subject and confirming, in the main lines, the conclusions which Marie reached. In some minor points, however, the various writers disagree with Marie's original statements.

Souza-Leite¹⁰³⁸ has published a thesis upon this subject, collecting all the recorded cases to the number of 35. His general conclusions agree with those of Marie, that the affection

is marked by great enlargement of the hands and feet, the increase being rather in thickness than in length; by alteration of the face, with enormous increase in the orbital protuberances (the nose and the lower jaw), by curvature of the spinal column, and by various subjective symptoms, such as headache, aching in the limbs, exaggerated hunger and thirst, polyuria, amenorrhœa, and general weakness. According to Marie, the disease is never congenital, and usually begins about the age of 20.

Marie and Marinesco,³_{Aug. 27} at the Tenth International Medical Congress, entered into an elaborate discussion of the pathology of this affection, having studied with care the lesions in the extremities, especially in the great toe, the metatarsus, and the nose. All parts were found hypertrophied, but the change was most marked in the connective tissue. In regard to the modifications of the bones they agree with Klebs, and confirm not only a hyperplasia but also osteogenesis, which causes a growth of bone in all directions. The increase in the size of the tongue is due chiefly to the enlargement of the skin and connective tissue. The nerves of the tongue present only insignificant alterations, which seems to prove that there is no connection between the alterations of the nerve and the hyperplasia of the tongue. The cervical sympathetic, particularly its lower ganglion, was the seat of an intense sclerosis; the glandular system was also much changed, and the kidneys presented the lesions of a cortical nephritis. The thyroid body was very much atrophied, and its follicles were enlarged and became cystic. The pituitary body was almost invariably very much enlarged. Marie and Marinesco conclude from these diverse lesions that acromegaly has an anatomical basis which is peculiar to it, and which serves to differentiate it from certain other diseases which somewhat resemble it.

Marie⁴⁵²_{Nov., Dec.} has also continued his elaborate studies of the anatomical changes of acromegaly by careful examinations and measurements of the bones, showing the character and extent of their enlargement. (Fig. 17.)

Thompson²⁷⁷_{July} has made a careful study of the skeleton in a case of acromegaly. The patient, who died of diabetes, was a man of large physical development, with overhanging brows, enormous hands and feet, and clumsy movements; he had no paralysis; the sight and hearing were unimpaired; his expression was dull

and devoid of intelligence; he was easily irritated and his fits of anger invariably terminated in hysterical weeping. There was a subarachnoid cyst involving the greater part of the right parietal lobe of the brain; the pituitary body was greatly enlarged. As a result of his examination of the skeleton he comes to the following conclusions: 1. Changes peculiar to acromegaly; enlargement of the pituitary fossa; disproportionate hypertrophy of the bones

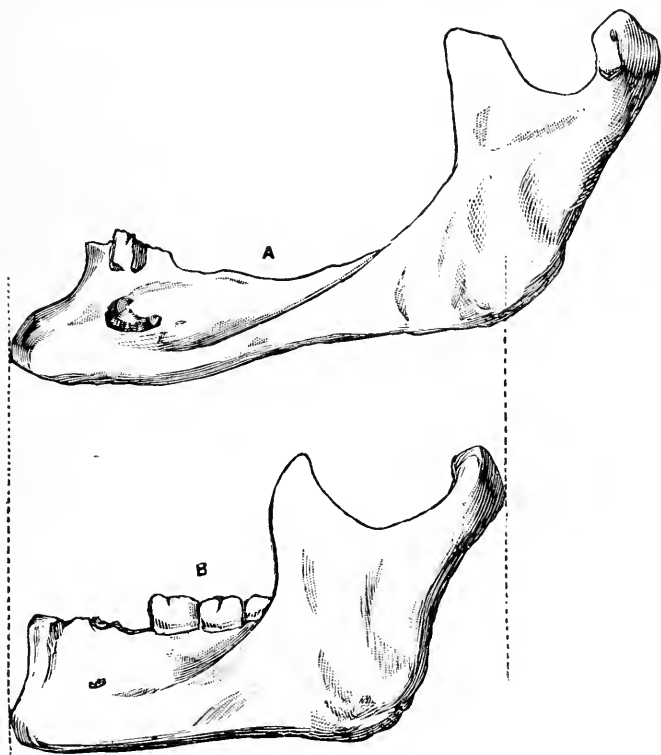


FIG. 17.

A. Inferior maxilla in acromegaly. B. Normal inferior maxilla.

(Nouvelle Iconographie de la Salpêtrière.)

of the face. Together with these changes, which, so far as we at present know, do not occur in any other disease, we may include, as constant and fairly characteristic accompaniments, the dilatation of the air-sinuses of the skull; the uniform hypertrophy of certain portions of the skeleton other than the face, viz., those of the cranium, the clavicles, and the metacarpals and phalanges; and, finally, the changes in the temporo-maxillary articulation, permitting of a forward subluxation of the lower jaw. 2. Changes which

result from a tendency to the formation of new bone both in normal and abnormal situations. These are seen in the mildest form in the great prominence of the ridges for muscular and ligamentous attachment; to a further degree in the ossification of the costal and other cartilages; in the ossification of ligaments (glenoid, cotyloid, vertebral, etc.); in the ossification of tendons and in the deposit of bone on the articulating surfaces, giving rise to exostoses, ankyloses, alteration of articular surfaces, etc. In these respects the skeleton in acromegaly shows an approach to the changes met with in osteo-arthritis, and, in a minor degree, to those occurring in osteitis deformans. The changes in the vertebræ, which result from the long-standing curvatures of the spine, usually present in advanced cases of acromegaly, are precisely similar to those met with under other conditions.

Von Recklinghausen,²⁰_{v.119,p.36} in discussing the hypothesis of the nature of acromegaly, holds that it is not, as Freund thought, an increase in the physiological growth, but a disease by itself, from the following reasons: 1. The weightiest factor lies in the increase of the projecting parts of the body,—that is, the extremities and prominent portions of the body. 2. This increase begins only when the general growth of the body is ended, and in opposition to partial macrosomy. There is always a symmetrical onset of acromegaly, but giant growth may be combined with it. 3. In acromegaly the affected parts are increased in thickness but not in length, with the exception of the lower jaw. Acromegaly is a disturbance of the bony growth. 4. In general the disease begins in the third to the fifth decade of life, which speaks against any abnormality of growth. He considers that there is some analogy between acromegaly and other forms of neurotic hypertrophy.

Waldo,²_{Mar.22} reports a case of autopsy where there were numerous cystic cavities in the brain, but the pituitary body was normal. Surmont,⁴⁵²_{July,Aug.} reports a case of acromegaly in a girl, beginning at the age of 14, and probably due to exposure to cold at the time of the first menses, which never re-appeared. There was hypertrophy of the feet, hands, and face, but no enlargement of the clavicles or retrosternal dullness. Guinon,¹⁰⁰_{Nov.9,'89} gives an interesting review of the subject and also,⁴⁵²_{July,Aug.} reports a case, still in the earlier stages, of only two years' duration, in a woman of 30, who had probably had some rachitis; the menses were frequent and irregular; the

electrical resistance was about normal; the hands were not specially deformed, yet, as the face and feet were fairly typical, the author reported the case as one of acromegaly, in spite of the persistence of the menses and the want of enlargement of the hands.

Marie, ¹⁴_{Dec. 25, '90} in a clinical lecture upon this disease, reviews the essential characteristics of the affection, mentioning, furthermore, that the development of the nails is not proportionate to that of the fingers; that molluscum pendulum is very frequent, and that there is usually peptonuria. He regards the suppression of the menses as constant and of considerable importance in diagnosis. He contrasts true acromegaly with a case which he had under observation, where the hands and nails were much enlarged, but the enlargement of the hands was not uniform. The limbs were not hypertrophied and the fingers were deformed; and the wrists, which in acromegaly are normal, were in this case enormous. Similar differences were found in the feet. There was also dorso-lumbar kyphosis instead of a cervico-dorsal; the tongue was normal. The bones were enlarged, the joints more or less ankylosed. This affection, which he regards as distinct from acromegaly, he calls pneumogenic hypertrophic osteo-arthritis. Schultze ⁶⁹_{Nov. 27, '89} carefully describes a case where, in the earlier stages, there was temporal hemianopsia, and where the sexual functions were unchanged. He speaks of another symptom which was not mentioned by Marie, namely, a marked prominence of the lower portion of the occipital bone. He found that iodide of potassium arrested the progress of the disease.

Graham ⁹_{Oct. 18} reports 2 cases, the fourth and fifth reported in America. He considers the symptoms which distinguish it from myxœdema to be that the dimensions of the bony skeleton are in many parts much increased, whereas in myxœdema the soft parts are alone affected; the face is elliptical instead of round, as in myxœdema; that in myxœdema there is a waxy and sealy condition of the skin, and in acromegaly there is no mental disturbance, which is so marked in myxœdema. Gauthier ⁷³_{May 24} describes a case of a man of 50, beginning with headache, vague pains, and loss of sexual power; the projecting portions of the face were much enlarged, the hands and feet enormous; there was cervico-dorsal kyphosis and a hypertrophy of all projecting portions of the

body. In the later stages of the disease there was a general weakness of the limbs and some dilatation of the heart, atrophy of the thyroid body, albuminuria, a peculiar respiration, and molluscum pendulum. There was also some dry arthritis. He questions whether the enlargement of the pituitary body so often found is anything more than an enlargement of one of the projecting portions of the body, regarding it as a true *ἄκρον*, especially since acromegaly has not been noted in the reported cases of tumor of the pituitary body. Hutchinson,⁸⁰⁶_{Oct., '99} reporting a case, mentions as an unusual symptom a very marked hypertrophy of the scalp. Other cases are reported by Péchardre⁹² and Schwarz²¹_{Sept. 10} where the sexual functions were normal and there was no dullness in the sternal region. Rolleston²_{Oct. 25} reports a case where there was also great muscular development and great strength. Silcock²_{Jan. 4} and Mosler³⁴_{July 29} also report cases. Bignami⁵⁸⁹_{Nov. 14} found a diminution in the sense of localization, the greater diameter of the tactile area being in the transverse direction; that is, the opposite of that which obtains in the normal condition. Manasse²²_{May 7} reports a case in a boy of 7 where the diagnosis seems doubtful. Campbell⁶_{Nov. 1} holds that acromegaly is not so rare a disease as is supposed, and thinks it will turn out to be more common than myxœdema. He claims to have obtained marked improvement from the use of arsenic.

MORVAN'S DISEASE.

In the last year's ANNUAL a brief note was given in regard to this very rare and curious affection, which was first described by Morvan, a physician of Brittany, in 1883. Charcot⁷³_{Mar. 15, 22} has devoted a lecture to this subject. The affection may be confounded with scleroderma, with anæsthetic leprosy, and with Raynaud's disease. Morvan himself gave the affection the name of "analgesic paresis, with panaritium of the upper extremities." In Morvan's original description he stated that the affection usually began in one side, but very often passed to the other side, and always ended in the production of one or more felons. The first case under Morvan's observation was one of thirty years' standing, a man of 60, who presented himself with a felon on one finger. Morvan proposed an incision, which was done, and he was surprised to see that the man made no sign of pain and admitted that he had not suffered in the least. Subsequently he proved the analgesia by

repeated tests. The characteristic features of the disease are: (1) severe pains at the onset; (2) paresis, with analgesia, first on one side and then on the other; and (3) the appearance of panaritium. In his later writings Morvan modified somewhat his first description, admitting the existence of other types where the panaritium were painful, or where there was no paresis or analgesia. The pains, according to Charcot, are of a neuralgic character. The paresis is associated with more or less atrophy affecting the hand and forearm, and later the analgesia develops. Besides this, however, there is anæsthesia to touch and to temperature, and Morvan claims that in this affection we never see the dissociation of sensibility, such as is met with in syringomyelia. The panaritium does not differ from the ordinary type, except that it is always of a severe form, and is followed by necrosis of the bone; it is always multiple, developing successively in the different fingers, and it is usually indolent. There may also be other trophic troubles and scoliosis. The duration of the disease may extend over a long period of years. The prognosis is grave, since it leads to the production of incurable deformities of the hands. The disease affects men more frequently than women, and outside of a small district in Brittany, where Morvan himself, in a population of 50,000, has seen some 20 cases, very few cases are reported. It may be distinguished from scleroderma by the presence of sensory disturbances and necrosis of bone, and scleroderma is furthermore characterized by the peculiar facial expression; it may be distinguished from leprosy by the history of exposure and by the absence of the peculiar morphœa of leprosy. The pathology of Morvan's disease is still uncertain, but Morvan himself believes that, while there may be some neuritis, it is subordinate to a lesion of the spinal cord, and that part of it especially which is the origin of the brachial nerves, affecting chiefly the gray matter. There have never been found any cavities in the cord in these cases, and no proof has yet been furnished that it is due to any infectious cause. Charcot further reports the case of a man who, after probable typhoid fever, began to have a prickling in one arm. Four years later there was a panaritium in the hand of an indolent type, and followed by others. The first of these was exceedingly painful, but the last was almost without pain. When these healed the patient discovered a marked weakness in the arm; there was also

distinct anaesthesia. Later he developed Ménière's disease and also hysteria. (Fig. 18.)

Guinon and Dutil⁴⁵²_{Jan., Feb.} also report the above case, as well as another somewhat resembling it, where there was severe pain in the back and right shoulder, a progressive weakness of the arm and leg on the right side, and trophic troubles in the right hand and sometimes in the leg. These consisted in the formation of bullæ, which would break, leaving ulcerations which were not particularly deep or severe. There was also a distinct scoliosis and anaesthesia to touch, pain and temperature over most of the right side, with atrophy of the right half of the tongue and of the small muscles of the right hand. The man had also hysteria.

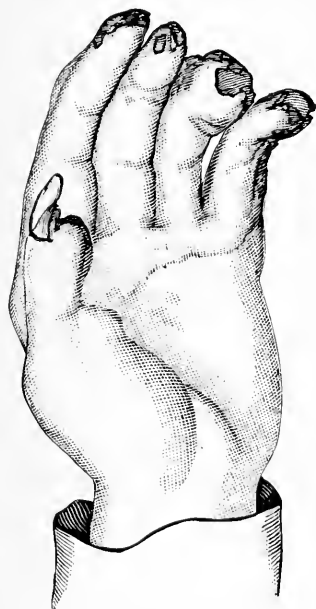


FIG. 18.—HAND OF A PATIENT
WITH MORVAN'S DISEASE.
(*Le Progrès Médical.*)

Morvan himself³⁶³_{Nov. 35, 36} has carefully re-examined 12 of his patients in order to prove that this analgesic paresis is a distinct disease from syringomyelia. In every case the tactile sensibility was apparently diminished over a greater or lesser portion of the arm, although Morvan used a more delicate test than has been employed in many cases of syringomyelia. There was never thermanæsthesia alone, and the disturbances of nutrition were much more frequent than in syringomyelia. He calls attention to the fact that there may be incomplete cases where the paresis is wholly absent

and there is only hypalgesia instead of complete analgesia, but the disturbances of nutrition are always present. There may also be improvement, where the paresis and anaesthesia may disappear, but the trophic disturbances remain.

Déjerine³¹_{July 10} discusses the distinction between syringomyelia and Morvan's disease, and shows that there may be a pronounced neuritis in syringomyelia which causes troubles of sensibility during life. In one of his cases an autopsy showed distinct changes in the nerves. He regards it as certain that syringomyelia may sometimes present a symptom-complex analogous to that of

Morvan's disease, but such cases are exceedingly rare. He holds it, moreover, to be very important that Morvan, in a small community, has seen so many cases, which he thinks goes to show that the disease belongs to the group of neuritis coming from infectious or toxic causes, in that respect resembling leprosy. Syringomyelia, however, is a relatively rare disease, even in large cities.

Chipault ⁷_{Jan. 17} reports a case of Morvan's disease with spontaneous fracture of a metacarpal bone and perforating ulcer of the hand. The sensory disturbances were very limited. Vallas ²¹¹_{May 11} also reports a case where there was abscess over the radius; the fingers were violet, with black spots on the extremities, but no true panaritium.

CEPHALALGIA.

Ollivier ²⁰²_{Dec. 28, '89} discusses the headaches of growing children. He maintains, however, that there is no special type of headache which can be regarded as due to the period of growth. Careful examination will usually show that cases of headache are due to errors of refraction, to inanition, to hysteria, or to some other definite cause, rather than to growth alone. Routh ²⁶_{Jan. 1} gives various cases of migraine and frontal, occipital, or vertical headache, due to troubles originating in the pelvis and curable by removal of the cause.

Ryerson ²⁵⁷_{Mar.} and Chisolm ⁴³_{Dec., '89} call attention once more to the frequency of headaches from the errors of refraction. Norstroem ⁶_{Sept. 27} thinks that certain cases of headache are due to inflammatory thickness existing at the insertion of various muscles, which do not usually cause any local pain and are generally the result of taking cold. He has obtained excellent results from massage of the indurated spots.

Migraine.—Sinkler ⁹_{July 19} gives a general review of recent observations upon the etiology and treatment of migraine. He considers that it is more prevalent among the wealthy classes; that it occurs at all ages, and may be due to reflex causes, chief of which are uterine diseases, eye-strain, nasal irritation, enlarged tonsils, and bad teeth. Some attacks recur on the same day of the week, and may be explained by the diet or duties of the preceding day. In treatment the general condition of the system should receive attention; local troubles should be treated as each demand.

Antipyrin, phenacetin, eucalyptus, and caffeine have been used with much success in the last few years. He also regards cannabis Indica of great value in many cases. In some cases hypnotism is said to work well. Diamantopulos, of Smyrna, Turkey (collaborator's report) confirms Sinkler's views as to the efficacy of cannabis Indica. Laviolette ¹²²_{Oct.} calls attention to the possibility of migraine arising from disturbances in the nose. Aulde ⁹_{Oct. 2} dwells upon the importance of proper feeding as a prevention of migraine.

Charcot ¹⁵_{Nov.} has recently reported a case of migraine with ophthalmoplegia. The patient was a woman of 35, who had had three attacks of very severe right-sided headache, which ceased suddenly and were replaced by a more or less complete ophthalmoplegia marked by ptosis of the right eye, strabismus, and diplopia, followed by paralysis of the right third and sixth nerves. There was also paralysis of accommodation on the right side and dilatation of the pupil, the paralysis lasting about five months. Peake ⁶_{Sept 27} has obtained benefit from the use of guarana.

NEURALGIA.

But little of importance has been added to our knowledge in the last year in regard to the causes, the course, or the treatment of this affection. Jacob ⁴¹_{Mar. 22} regards it as merely the most marked manifestation of the sensory function, comparing it with tetanus as the most marked manifestation of the motor function. He considers that anæmia and spasm of the small arteries are the fundamental features of the disease, and with these there is often some œdema in the affected parts. Steiger ¹⁵⁰_{Aug.} describes a form of neuralgia which he considers typical of a syphilitic origin, namely, a neuralgia limited to a narrow strip on both sides of the skull, ascending vertically from the ears about in the position occupied by a child's comb. This he regards as entirely distinct from any affection of the bone. Weir Mitchell ²⁴²_{July} states that one of his patients has made elaborate studies and observations of the effect of the fluctuations of the weather upon his neuralgic paroxysms. He notes that the maximum of pain bore direct proportion to the prevalence of storms, and that the aurora was a certain precursor of an increase of the neuralgia. Heddens ⁵⁶⁸_{Oct.} mentions 2 cases of neuralgia which he considers due to the compression of some of the minute fibres from absorption of the alveolar processes in old

persons who had lost their teeth, which were relieved by surgical interference. Ritchie³⁶_{Mar.} reports a case of epileptiform neuralgia which was relieved by the removal of half an inch of the nerve. Golding Bird⁴²⁸₂₉ describes, under the name of "deltoid neuralgia," certain cases of intense pain at the point of insertion of the deltoid muscle, which simulated a paralysis of the muscle when attempt was made to move the arm. It is always due to injury, which, however, may have been slight.

Various unimportant cases are reported by numerous writers, and many suggestions are made as to treatment, but most of them are of little importance.

Fraenkel⁹_{Mar. 16} reports a new method of treating facial neuralgia. He gives a hypodermic injection of cocaine in the affected place, and then applies the strongest current of faradic electricity the patient can bear, placing one pole at the foramen of exit and the other on the course of the nerve one-half inch distant. Leslie³⁶_{Jan.} reports a sudden and immediate cure of many cases of facial neuralgia and odontalgia from the application of powdered salt to the nasal mucous membrane. Luciani⁸_{July 3} again advocates the use of injections of osmic acid for neuralgia. Bassette²⁴²_{June} has obtained some success with gelsemium, and Steiner⁶⁹_{July 17} has obtained good results from the use of chlormethyl. Kums⁷⁰_{May 18} recommends the injection of sulphuric ether for rheumatic neuralgia. The injections should be made as near as possible to the seat of pain, and should be followed by massage.

Sciatica.—Guinon and Parmentier⁹⁴_{Sept.} describe a complication of sciatica not generally recognized. This complication, which is rather serious and gives rise to an unfavorable prognosis, consists of a neuritis localized in the external popliteal nerve, and associated with degenerative atrophy of the muscles supplied by it. This neuritis is attended with motor and sensory disturbances in the distribution of the nerve, paralysis of the extensors of the foot and toes, and anæsthesia to pain, temperature, and touch over the dorsal surface of the foot and the external surface of the lower leg. With the paralysis there may be more or less atrophy of the affected muscles, with more or less complete reaction of degeneration. This peculiar complication has been previously recognized in the cases of injury to the sciatic during labor, from pressure within the pelvis, and various writers have endeavored to explain

it on anatomical grounds, claiming either that the external popliteal was a direct continuation of the sacro-lumbar trunk, or that the sciatic divided anomalously high up in the pelvis. Guinon and Parmentier, having demonstrated that this localized neuritis is occasionally found in ordinary sciatica, doubt both these hypotheses, and are disposed to believe that the reason of this special selection of a single branch is as yet undetermined, although they admit the possibility of an analogy with the greater predominance of extensor paralysis in lead poisoning and other peripheral affections. When this trouble occurs the case is apt to be protracted, lasting two or three years, and a cure is difficult and often impossible.

Brissaud⁹¹_{Jan.} has made a further study of the attitude of patients with sciatica, described some time ago by Babinski. He finds not infrequently a "sciatic scoliosis,"—a curvature of the spine, with the convexity toward the affected side. The leg is also slightly flexed, and is supported on the toe. There is often a compensating curvature of the spine higher up. This position is sometimes of service in diagnosis in the early stages of the disease, and the contraction sometimes persists after recovery. It is due simply to the effort which the patient makes to keep the weight off the affected leg. In a few cases, however, there is contraction of the muscles on the affected side, causing the concavity on that side. This is due to spasm, and is seen where the neuralgia is not limited to the sciatic nerve, but affects other nerves in the sacro-lumbar plexus. Souques⁴⁵²_{Sept., Oct.} reports 2 cases of complete cure of this deformity of the trunk, which persisted even while sitting and in bed. Before it is of use to attempt to correct the vicious attitude, the cause—namely, the sciatica—must be attacked. He considers that the deformity may be completely cured, at least temporarily, if not permanently, and after a comparatively long duration. The cure, however, depends essentially on the cure, or, at least, the amelioration, of the sciatic pain. It is still impossible to determine the prognostic influence of the form of sciatica, of the duration, and of the degree of the deformity.

Jaccoud points out a cause which is little recognized, viz., varicocele, which is often accompanied by a considerable development of the veins within the pelvis. He considers rest in bed as one of the fundamental conditions of treatment. Delobel²¹_{Jan. 5} has

treated a case by injections of antipyrin. The case was severe and of long duration, and over 800 injections were made. In only 1 case was there abscess formation, and no inconvenience was suffered from breaking off the use of the drug suddenly.

Hammond²⁴²_{May} opposes the view that rheumatism, syphilis, or gout have any importance in the etiology of sciatica. He advocates three measures in the treatment,—rest, cold, and electricity. Rest is obtained by a long splint, from the axilla to the ankle, applied to the external surface of the thigh. Cold should be applied by ice-bags along the course of the nerve. Galvanism should be used, a very large negative electrode over the sole of the foot and another large electrode, positive, over the gluteal region at the point of exit of the nerve, using as strong a current as the patient can bear, and avoiding interruptions. Other treatment is merely symptomatic. Nordhorst¹¹⁶_{June} praises electrical massage in the treatment of sciatica.

CHOREA.

Etiology.—In last year's ANNUAL reference was made to the theory of Garrod, that chorea may be due to a temporary overgrowth of connective tissue in the nerve-centres, supposed to be due to rheumatic poison. MacLagan⁶_{Nov.30,'89} opposes this view, claiming that there is no evidence that the rheumatic poison is capable of causing such an increased growth and that all cases of chorea are not cases of rheumatic origin. He holds that the motor centres may be the seat of functional disturbances due to different agencies, and claims that chorea is common in rheumatic patients, as chorea is a disease of the motor centres and rheumatism a disease of the motor apparatus. Garrod⁶_{Dec.7,'89} replies to this by saying that rheumatism is capable of producing increased growth of connective tissue, as shown by the formation of subcutaneous rheumatic nodules, and thinks that this temporary overgrowth of fibrous tissue may be produced by other causes besides rheumatism; which leads MacLagan⁶_{Dec.14,'89} to reply that choreic symptoms must be explained without reference to rheumatism.

Among other causes of chorea Jacobi¹_{July 6} calls attention to cases due to nasal irritation, and Leonard⁵¹_{Apr.} reports a case where chorea was apparently due to an adherent præputium clitoridis, where a removal of this cause produced an immediate cure of the chorea.

Rheumatism and Chorea.—Meyer⁴_{July 14} has analyzed the cases in the Berlin Charité. Six-tenths of 1 per cent. of all the children treated in five years had chorea,—121 cases,—of whom 9 per cent. had rheumatism, 13 per cent. heart disease, and 2 per cent. the two combined. Chorea, he holds, is a symptom, like convulsions, due to various causes. It may be a disease in itself, a neurosis due to psychical causes; it may arise from organic brain disease; or be a disease due, perhaps, to a rheumatic virus, which has for its symptoms rheumatism, heart disease, and chorea.

Leroux¹¹⁸_{June} reviews the previous statistics on the relationship between chorea and rheumatism, and gives personal statistics based upon 80 observations, which show only 5 clear cases of rheumatism with chorea, but many cases of chorea without rheumatism, and also many cases of rheumatism without chorea. The statistics also show that between the ages of 8 and 15 chorea is more frequent than rheumatism, and that growing-pains are more frequent than chorea and rheumatism combined. Taking all the different statistics together, he finds that rheumatism occurs in 22 per cent. of the cases of chorea. In regard to cardiac complications of chorea, he found a mitral lesion in 5 cases and an anæmic souffle in 8, an extra-cardiac souffle in 1, and in 66 cases the heart was normal. In many cases infectious diseases had preceded the chorea, but diseases of the nervous system preceding chorea were distinctly rare. In 16 of the 80 cases rheumatism was found in the antecedents, and hysteria was found in 14 of the 80. He considers it preferable to regard chorea and rheumatism as entirely independent, and to hold to the opinion that chorea is a neurosis.

Herman⁸⁵⁷_{Nov., '89} has analyzed 50 consecutive cases of chorea; 40 per cent. of the same occurred in the spring and about 20 per cent. in each of the other seasons. Eighty-two per cent. of the cases were females. The children, as a rule, were in a lowered physical condition. In only 6 per cent. of the cases was there a history of rheumatism. In 42 per cent. fright was considered as the exciting cause. Jenkins⁶_{Aug. 30} holds that reflex irritation is a common cause of chorea, and that rheumatism and heart disease have very little to do with chorea. He contrasts chorea with migraine. In both heredity is important. Both are paroxysmal,—the one exploding in pain, the other in motor disturbance. He

considers that chorea may be due to disturbances of the vasomotor centre, and by this he explains the various symptoms.

Pathology.—Laufenauer⁶⁸_{June} has made autopsies upon 5 cases of severe chorea, to which he is inclined to ascribe an infectious cause. The patients suffered from very intense muscular contractions, which continued during sleep. There was also mental disturbances. The characteristic changes found in the autopsies were very marked hyperæmia, both in the cortex and in the basal ganglia. The most characteristic lesion was an acute encephalitis, involving the whole central nervous system. In almost every case there was endocarditis. He found in the cortex a diffuse round-cell infiltration and capillary hæmorrhages. In one case he found in the first and second divisions of the lenticular nucleus the hyaline bodies described by Flechsig. He considers ordinary chorea as an infectious disease caused by the microbe of rheumatism. Wollenberg⁶⁸_{June} has also found these bodies described by Flechsig, which apparently have nothing to do with paralysis and resist most chemical reagents.

Dana⁴⁷_{Oct.} reports an autopsy of a case of chorea and tabulates 39 other autopsies. He found the chief changes were just beneath the cortex, where the white matter was honeycombed with little spaces, round or oval. These spaces were empty or partly filled with blood-vessels. The process, he believes, was non-inflammatory, and was due to abnormal dilatation and filtration of the vessels' contents. The same changes were found in the basal ganglia and the internal capsule, whose fibres were split up by interlaced and dilated vessels. He also noticed a varicosity of the nerve-fibres. In the recorded cases the most marked changes were hyperæmia, periarterial exudations, erosions, softened spots, multiple hæmorrhages, and occasionally embolisms. The changes are most marked in the deeper parts of the motor tract; but he considers chorea not as a local disease, but as a disease of the intra-cranial motor tract, including its starting-point in the cortex and especially in its co-ordinating adjuncts,—the lenticular nucleus and thalamus.

Fisher²⁴²_{p.221} considers that the primary seat of the lesion in chorea is in the cortex, and in the chronic cases it is probably a kind of general sclerosis, somewhat resembling multiple sclerosis, although less coarse in character. Jacobi⁵¹_{Nov.} gives an interesting clinical lecture upon a case of chorea, in which he holds to the connection

between rheumatism and heart disease. Finlayson⁵¹_{July} reports several cases of febrile attacks in the course of chorea which he considers due to endocarditis, and holds that endocarditis and rheumatism are very closely related to chorea. Whenever these febrile attacks occur, he insists upon rest in bed. Brown⁶_{Apr. 19} reports a case of chorea in a girl of 16, where finally a typhoid condition developed and the patient suddenly collapsed. At the autopsy an acute paralytic distension of the stomach was found. Various other cases of chorea are reported by different writers, but they mainly rehearse our former knowledge of the subject and afford no new information.

Chorea Associated with Other Nervous Affections.—One or two cases where multiple neuritis has been found in connection with chorea suggest the possibility that the arsenic used in the treatment of the disease has given rise to chronic poisoning. Fry²⁴²_{June} reports a case of chorea associated with erythema nodosum, but without rheumatism or heart disease. During a second attack of chorea the patient had paresis of the lower extremities and later of the arms, with numbness and tingling, loss of reflexes and reaction of degeneration in many of the muscles, together with some muscular atrophy. She had been taking arsenic for a month, but on previous occasions she had taken larger quantities and for a longer time, and the neuritis ran a protracted course after the arsenic was discontinued. Fry suggests the possibility of an infectious origin for the chorea, without bringing forward any new evidence. Semple⁶_{June 14} reports a case of chorea where, after taking arsenic for about four weeks, there was weakness in the right arm and both legs, with symptoms of a peripheral neuritis and a curious, dark-brown pigmentation of the skin extending all over the body. This pigmentation ceased as soon as arsenic was stopped, and the paralysis was thought to have been due to the arsenic.

Lockie⁶_{Aug. 2} reports a case of chorea where, a week after the onset of the disease, there was loss of power of speech; there were also attacks of frontal headache, with rise of temperature. The patient made a complete recovery. Although no murmurs were heard in the heart, Lockie holds that the aphasia was due to embolism from some undiscovered lesion of the heart.

Rondot⁷⁰_{June 8} reports a case of muscular atrophy in chorea, and

has collected 2 other cases of the same sort. All these 3 cases were those of so-called "paralyzing chorea," which came on in subjects with acute rheumatism and endocarditis. The muscular atrophy seems to develop as a sequel of the painful affections of the joints; it does not appear in the cases of paralyzing chorea without such pain; it has also never been observed in ordinary chorea without paralytic symptoms. It does not modify the reflexes, which are ordinarily abolished from chorea, and it may be accompanied by preservation or exaggeration of the faradic excitability. Raymond³_{May 21} also reports a case which Rondot quotes. In all the cases of paralyzing chorea he thinks that the muscular weakness is out of proportion to the intensity of the choreic movements. His patient, 17 years of age, had a marked muscular atrophy of the paralyzed arm. While Rondot holds that this atrophy is connected with rheumatism, Raymond dissents, having found that in all cases of rheumatism, whether followed or not by muscular atrophy, the reflexes were exaggerated, whereas in these cases they seemed diminished or absent.

Hereditary (Huntington's) Chorea.—Huet²¹²_{June} has studied various chronic cases of chorea in adults. It is quite exceptional in children, usually beginning between the ages of 40 and 50. It is more common in men than in women, although pregnancy has a certain influence upon its development. The motor troubles are of the same type as in ordinary chorea, but the involuntary movements are slighter and less extensive. The influence of the will is much greater and can cause the arrest or diminution of the movements. The notable difference from Sydenham's chorea consists in the frequent occurrence of mental troubles,—a gradual progressive enfeeblement of the memory and intelligence, leading to dementia. This form of chronic chorea is regarded as merely a variety of ordinary chorea, and probably does not differ materially from Huntington's chorea, except that it may occur in patients where there is no special heredity.

Biernacki⁴_{June 2} describes the case of a man of 48, who had been suffering from choreic movements for five years. His mother and maternal grandfather had been similarly affected. The movements occurred in the head, face, upper extremities, and trunk, with from twenty-five to thirty movements a minute, becoming more marked under excitement. In sleep they disappeared entirely. On

voluntary movement they were much diminished, which is considered to be a distinguishing feature of this form of chorea as compared with ordinary chorea. The memory was considerably impaired.

Aróstegui⁴⁵⁹ does not consider that the symptoms of Huntington's chorea are sufficiently characteristic to warrant us in regarding it as a separate variety. He reports 2 cases, but holds that heredity is common in all nervous weaknesses, and is not sufficient to establish it as a separate affection; the symptoms are the same as those of Sydenham's chorea, except that it is chronic and progressive and may last twenty or thirty years. Mills²⁴²_{Mar.} reports several cases of chorea and tremor, and gives several cases of hereditary chorea in adults, one of them in a negro.

Chorea and Insanity.—Diller⁵_{Apr.} has carefully studied chorea in adults, especially in the insane. He has collected from twenty-three hospitals for the insane, with 16,499 patients, no less than 39 cases, which he has carefully tabulated, and from which he derives the following conclusions: 1. There is to be found among the insane in hospitals and asylums in this country 1 choreic patient among each 425 of population. 2. In all long-standing cases of chorea there is a more or less marked tendency to mental deterioration, which, in many cases, progressively increases and finally terminates in dementia. 3. Many cases, even when there exists a considerable degree of mental impairment associated with chorea, enjoy fair physical health, and apparently live almost as long as they would have done had they been free from mental and nervous affections. 4. The proportion of male to female adults is in about the same ratio as is found to exist between the sexes in children affected with acute chorea. 5. The same causes that are known to produce chorea in children are found to operate in causing the disease in adults: but, in the case of the latter, additional causes peculiar to adult life, such as apoplexy, anxiety, etc., are capable of producing the disease. Emotional causes may produce chorea when operating on a person already predisposed to the affection. A person having a family history of insanity, chorea, or epilepsy, or, indeed, any nervous affection, is predisposed to an attack of chorea. Persons popularly known as "nervous" are especially predisposed to an attack of chorea; but when the disease is noted to exist in phlegmatic, robust persons, it is probably the result of

rheumatism or coarse brain-lesions. 6. Persons of adult years are sometimes, though rarely, attacked with chorea while suffering from rheumatism, the disease being of about the same character as that commonly observed in children, but more likely to become chronic. 7. As to the pathology, the following appear to be reasonable conclusions: (*a*) a number of cases arise from, and are caused directly or remotely by, an attack of rheumatism; (*b*) in the majority of cases heart disease is absent, and there is a negative history as to rheumatism; (*c*) coarse lesions, acting as irritants to the motor cells of the brain or the tracts proceeding therefrom, are in some cases the prime cause. Such lesions most commonly are clots, recent, organized, or broken down. 8. Chorea is to be found at all ages. 9. Persons may inherit the disease directly. 10. The disease may be congenital. 11. Chorea and epilepsy are intimately related to each other. Epileptic convulsions (Jacksonian) may be confined to a single member; the same is true of choreic convulsions.

Régis¹⁸⁸_{July 20} reports a case of choreic insanity, and furnishes an interesting statement by the patient after his recovery of the hallucinations from which he suffered. These hallucinations were all of a terrifying character, and came on in the period just preceding sleep; but they differed from those of ordinary insane patients, for the patient's intelligence remained intact; he preserved his judgment, and was astonished by them and unable to comprehend them, acting more in the fashion of a person in a dream than of a true insane patient. The form of delirium seemed to be very closely akin to that of alcoholic delirium. Macfarlane¹⁶⁶_{Jan.} reports a fatal case of chorea with insanity, where the membranes of the brain were thick and adherent, especially at the base.

Chorea Major.—Wichmann⁶⁹_{July 17, 24} reports a very interesting epidemic of chorea major at Wildbad. He considers that the psychological element plays a very great rôle in the origin of this form of chorea, and that the influence of example acts in the way of suggestion. He is not disposed, however, to regard chorea major as simply a manifestation of hysteria. The movements are, it is true, more rhythmical, purposive, and co-ordinated than those of ordinary chorea; but a certain number of his patients presented the typical symptoms of ordinary chorea, while others were affected with rhythmical chorea. The children affected in this epidemic all

attended the same school, and some time before there was an epidemic of jaundice, from which 9 children suffered; only 4 of them, however, were subsequently the victims of chorea. The author regards the jaundice as being of an infectious character; 26 children, 18 of them girls, were attacked with chorea, 13 girls presenting the symptoms of so-called rhythmical chorea and 5 of genuine chorea; only 1 case had any cardiac affection and only 1 rheumatism. Of the cases of genuine chorea not one had either heart disease or rheumatism. The affected children were not removed from school, to which the author laid the spread of the epidemic. He also thinks that hysteria played an important part.

Peculiar Forms of Chorea.—Weir Mitchell and Burr²⁴²_{July} report 3 cases of chorea, possibly involving the spinal cord. The first case was that of a young man of 19 and was congenital. There was also distinct ankle-clonus and rigidity of the legs; the movements bore a certain resemblance to those of chorea in dogs, which is known to persist after section of the cord. In this case there was supposed to be organic changes in the motor tract involving the cord, but whether confined exclusively to it or not the authors consider it impossible to say. The second case, that of a man of 46, was hereditary and complicated with spasmodic wry-neck. The third case was one of choreic spasms, confined to the legs, in a man suffering from paraplegia.

Morvan²⁴²_{June} reports a case of what he terms “fibrillary chorea,” which is characterized by fibrillary contractions in the muscles of the legs, extending to the upper extremities, but always respecting the muscles of the neck and face. These contractions are never accompanied by trembling or by the displacement of any portion of the body. The patient can accomplish all desired movements, and the spasm stops in the affected muscle when any voluntary movement is executed. This affection seems to occur during adolescence. The cause is still uncertain and lapses are not uncommon. Most cases recover in from two to three months, yet one has proved fatal.

Dunbar¹³¹_{Sept.} reports a curious case of involuntary movements, which consisted of bending down to one side or the other several times a day, and associated with bronzed skin. It was believed to be due to a spasm of the muscles, and followed an injury to the

twelfth dorsal and first lumbar nerves; from the bronzing of the skin it was supposed that the injury had also affected the suprarenal body. Harrigan⁸²_{Apr.20} reports a case of involuntary contractions, involving nearly all the muscles of the body, where the mental condition was unaffected, and where syphilis seemed to be the cause. Iodide of potassium caused a complete cure.

Electrical Chorea.—It seems as yet uncertain whether this affection, first described by Bergeron, can be regarded as an independent disease or as merely a variety of paramyoclonus. It is highly improbable that it has anything in common with Sydenham's chorea. Bouveret and Curtillet²¹¹_{Oct.19} state that the disease is favored by any debilitating cause, but that an emotional shock or fright is most commonly the exciting cause. It is characterized by involuntary, very sudden twitches of the muscles, like the twitches produced by the sudden passage of an electric current. They are aggravated by emotion or by a voluntary effort to repress them. There are no other affections except those of motion, and these almost invariably recover. The case that they report was in a girl of 15, who had previously suffered from tetany, and the trouble came on soon after a family quarrel. The case is peculiar in that the spasm was very extensive, involving the muscles of the trunk, the head, and arms, and at the height of the paroxysm there were as many as 140 twitches a minute, unlike paramyoclonus, where the movements are variable. In this affection each new shock invariably causes the same contractions in the same muscles.

Thomson³⁶_{Sept.} also describes 2 cases of this affection, and another case is reported by Hermann.⁶⁵_{Mar.}

Treatment.—In the past year comparatively little has been added to our knowledge in regard to the treatment of chorea. Rest, hygiene, and tonics, of which arsenic is still the first, remain our chief resources in the treatment of this affection. As has already been said, some writers hold to a possible infectious origin for chorea; but this hypothesis has had as yet comparatively little influence upon treatment. Dresch,⁶⁷_{Apr.30} however, believing that chorea is due to a micro-organism belonging to the same family as that of rheumatism, and regarding chorea as a grave disease, believes that therapeutic measures should be adapted to this view, and therefore he advocates strongly the use of salicylate of sodium,

which, he thinks, has an excellent sedative action, relieving not only the pain of rheumatism, but restraining the movements of chorea. He claims, moreover, that it aids the elimination of waste-products, whose formation must commonly be increased in chorea.

Although rest, hygiene, and arsenic must be our main reliances in treatment, still, in certain cases, hypnotics seem to work well as adjuvants in restraining the violence of the movements. Jeffries⁹_{Mar. 15} reports 10 cases of chorea in which he employed sulphonal. Of the cases 5 were first attacks of recent origin, and they all recovered within three weeks; in 2 of the cases arsenic had failed; in 2 it was never used, and in 2 arsenic and sulphonal each failed alone, but together were quickly followed by improvement; the other 5 cases were either of long standing or second or third attacks; 4 were at the period of puberty. Three of these cases continued at least for a month; in 3 arsenic had failed; in 2 it was not used; 2 did not recover under any treatment. Jeffries believes that sulphonal often acts favorably in the disease, but holds that it is indicated only as an adjuvant to arsenic, as on sulphonal alone the patients were apt to grow pale and clearly showed the need of a tonic. Gerlach³¹⁴_{v. 46, No. 5} also advocates the use of hypnotics, especially for the purpose of quieting the muscular unrest, and for this purpose he recommends especially paraldehyde, which, he says, has no influence upon the mental disturbance, but promotes sleep, quiets the muscles, and also has no bad effect upon the heart. It would seem probable that the hypnotics, like sulphonal and paraldehyde, which apparently have a favorable action, are to be recommended especially in those cases of chorea attended by very marked motor disturbances.

Gautier²⁴_{Dec. 8, '89} has obtained excellent results from electricity, from galvanism to the spine, without the use of any medicine. Jaffé⁶⁹_{Feb. 27} reports a case of chorea of five months' standing which was cured by hypnotism, and Adams⁵⁶⁸_{June} has been equally successful in the use of this method of treatment. In view of the success, however, which can usually be obtained by other means, and on account of the somewhat dangerous character of this procedure, it will hardly commend itself to ordinary use. The report of the Stevens Commission in New York²⁴²_{Dec., '89} has also some bearing upon the treatment of chorea. Of the 14 patients submitted by the

commission to Stevens 5 had chorea. The first case was one of chronic chorea, which had previously shown a period of spontaneous improvement, and had also improved under arsenic. Thirteen operations were performed upon the ocular muscles and seven or eight different forms of glasses were employed. Under this treatment the chorea varied more or less, sometimes better and sometimes worse, but at the end of thirty weeks was improved. The second patient had had chorea for five weeks, with copolalia; was under treatment by Stevens for two years without improvement. The third case was one of electrical chorea, which continued for nine years and did not improve. The fourth case lasted for three years; after eighteen months of continued treatment was not improved. The fifth case was of three years' standing, and in many respects was distinctly improved under treatment. The report of that commission and the result of Stevens's treatment of their cases render it highly improbable either that chorea is due to any error of refraction or insufficiency of the ocular muscles, or that treatment directed solely to this end is likely to cure chorea.

ATHETOSIS.

G. M. Hammond⁹⁹_{July 17} reports the autopsy of the original case of athetosis, upon which W. A. Hammond's description of the disorder was based. After briefly referring to the case, G. M. Hammond stated that the portion involved in the lesion had consisted of fibrous connective tissue. Topographically, the lesion was a lengthy one in the antero-posterior direction, parallel in its short axis with the internal capsule. Its posterior end had invaded the stratum zonale of the thalamus on its posterior third and the posterior half of the internal capsule. In its anterior extension it had crossed the capsule, invading the posterior third of the outer lenticulus. The author called attention to the fact that the motor tract was not implicated in the lesion, and argued that this case was further evidence of his theory that athetosis was caused by irritation of the thalamus, the striatum, or the cortex, and not by a lesion of the motor tract.

Massalongo⁷³_{Jan. 18, Oct. 11} reports 4 cases of double athetosis which have come under his personal observation, and has collected 31 others. The following points enable us to distinguish it from hemiathetosis:—

HEMIATHETOSIS.

1. Only one side of the body is affected.
2. In the majority of cases the affected side is more or less hemiplegic.
3. Hemiplegia precedes the athetosis.
4. Usually there is more or less anesthesia on the affected side.
5. In repose the movements are more violent and persistent. The facial muscles are but rarely implicated.
6. The autopsy has always revealed profound intra-cranial lesions.
7. Hemiathetosis is not an independent affection, but secondary to well-known cerebral lesions (the posterior half of the internal capsule, etc.), as in hemichorea.
8. Hemiathetosis finds its analogue in symptomatic hemichorea.

DOUBLE ATHETOSIS.

1. Both sides affected.
2. Double athetosis is most frequently found among idiots and imbeciles.
3. Is primary, congenital, or appears in early childhood.
4. Is not preceded by motor paralysis, and sensibility is ordinarily preserved.
5. The movements are less violent and persistent in repose. Facial muscles, and even muscles of the tongue, are frequently implicated.
6. In the only 2 cases where an autopsy has been performed, lesions of the dura mater and of the convolutions existed.
7. Double athetosis is a special, independent, and primary affection.
8. Double athetosis finds its analogue in common chorea.

Anatomically, he thinks there may be a lesion of the cerebral convolutions, with descending degeneration; so that double athetosis may be regarded as a cerebro-spinal affection. The abnormal movements are caused by an irritation of any portion of the motor tract.

Rienzi⁵⁰⁵₅₆ considers that there is no absolute difference between athetosis and post-hemiplegic chorea. If the lesion be acute, hemichorea is produced; if chronic, hemiathetosis. In chorea the movements are sudden and involuntary; in athetosis they are slow, and ordinarily do not interfere with voluntary acts. He regards the lesion of athetosis as undoubtedly in the cortex of the brain, and considers that the best success may be obtained from galvanism there and also to the head. Seguin⁹⁹_{July 17} reports a case of athetosis, or choreic spasm of the right side of the body, due to a tumor of the left optic thalamus and adjacent internal capsule. He believes that all the cases of athetosis and chorea following hemiplegia are due to lesions in this vicinity.

Other cases are reported by Beevor,²_{Mar. 22} Byers,²_{July 26} Workman,²¹³_{May} Scheiber,³⁶⁸_{v. 22, p. 220} Rubino,⁶_{Mar. 22} and from the Cook County Hospital.²³¹_{July}

SPASM.

Tic Convulsif.—Grasset,⁹⁴_{July, Sept.} has made an elaborate clinical study of a case of this affection, and also of a case of hysterical

trembling. He subdivides the abnormal movements into four classes: (1) trembling during repose, of which the type is paralysis agitans; (2) trembling with involuntary movement, of which the type is multiple sclerosis; (3) abnormal contractions during movement, of which the type is tabes; (4) abnormal trembling during repose, of which the type is chorea. *Maladie des tics*, first described by Gilles de la Tourette, comes under this last class. It differs from ordinary chorea in the fact that the movements are always clearly limited and identical, and there is no passage from the contractions of one muscular group to the other. There is, moreover, an absolute repose during the intervals between the contractions; this interval of repose suffices, also, to distinguish the affection from rhythmical chorea, which is regarded as one manifestation of hysteria. It differs from paramyoclonus in the fact that the movements are co-ordinated, systematic, and may be compared to a voluntary act. In addition, the patient under discussion gave utterance to certain inarticulate sounds, although there was never utterance of words, as in coprolalia. Grasset states that these peculiar motor disturbances are also accompanied by various psychical disorders, or psychical stigmata, which he terms "psychical tic." These phenomena represent various forms of fixed ideas and morbid fears,—the different manifestations of the insanity of doubt. Descroizilles¹¹⁸_{Aug.} reports 2 cases of the affection, and thinks that the prognosis is not good; in one case, however, he found that suspension was a benefit. Catron¹⁰⁵⁹ has published a thesis upon the subject, in which he holds that the disease is hereditary and usually begins in childhood by motor troubles, which are systematic and always the same in the same individual. They come on suddenly and rapidly, are diminished under the influence of the will, cease during sleep, and disappear under any febrile disease; they are accompanied by remissions and exacerbations. The patient may remain at this stage for a great many years, and never go beyond it. The period which succeeds is characterized by excitement, during which the patient suddenly makes an inarticulate cry, which becomes articulate later, and takes the character of an echo; or the articulate word may be an oath or some filthy term, the same term being used every time and being uttered at the same time as the muscular twitch. Cases of tic in isolated muscles are reported by Klemperer⁴¹_{Oct. 27} and

Henschen,²⁴²_{Jan.} and other cases of general tic are reported by Alessandro⁵⁰⁵_{Oct., '89} and Croce.⁶⁰⁵_{v.11, p.181} Croce's case had various peculiar symptoms. The patient not only repeated words—echolalia—and had coprolalia, but also repeated the gestures and acts of the people about him, and his speech was singing.

This case is of interest in comparison with the peculiar disease of Siberia, which has been erroneously termed myriachit in this country, but which should be properly spoken of as meriatschenje. This has recently been studied by Tokarski.⁷⁵_{Nov.1} In this affection there is no convulsive movement, but the patient, against his own will, and as the result of an irresistible impulse, performs senseless and even criminal acts as soon as commanded to do so, or as soon as he sees such acts done. Two cases are reported. The writer considers the affection, however, to be entirely distinct from tic convulsif.

PARAMYOCLONUS MULTIPLEX.

Le Moine and Le Maire⁹²_{Dec., '89} have made a very careful study of this affection, collecting 30 cases from the general literature, and reporting a new case under their observation. From these cases they decide that the affection is usually brought on by a violent emotion, by fright, unwonted effort, or injury. It usually begins in the lower limbs, consists of not very violent but sudden muscular twitchings, which at first do not prevent the patient from pursuing his usual occupation. The muscular contractions do not cause any marked movement of the limbs, and can be controlled by the will; they cease during voluntary movement. In some cases they affect the muscles of the face. The spasm may be choreic or tonic. They are seldom synchronous and are not necessarily symmetrical. In a few cases the muscular twitchings are rhythmical, but that is the exception rather than the rule. The number of twitchings a minute seems variable, the lowest recorded being 5 and the highest 180. Unverricht²¹_{June 9} has made a careful study of the curves of respiration and muscular twitches in paramyoclonus, which shows that excitement increases the twitching and that the twitchings can be acted upon by the influence of the will; that they are rhythmical and of unusual strength; and that during excitement, although the respiration is under the influence of the will, the twitches may become so severe as to prevent

speech. Other cases are reported by Peiper,⁶⁹ Giampietro,⁵⁹⁶ and Grainger Stewart.³⁶

DUPUYTREN'S CONTRACTION.

MacReady,² in an interesting article discussing the treatment of this affection, argues very strongly against the method of treatment by an open wound and in favor of the subcutaneous method. He reports a certain number of cases treated by the open-wound method, which proved a failure, where the formation of cicatrices rendered the subsequent condition of the hand hopeless; whereas, with the subcutaneous method, if the operation prove a failure it can be repeated without special trouble. Adams² has not met with any cases of possible nervous origin, and considers that the contraction is due to a gouty thickening of the palmar fascia. He supports MacReady's view, and considers that the open-wound operation is totally inapplicable to the case of phalangeal contraction. Hutchinson⁸⁰⁶ reports a case of contraction of the fingers, extending into the palm, after a severe brain disease, which seems more probably to be a nervous phenomenon than a true case of Dupuytren's contraction.

TRIGGER-FINGER.

Poirier, of Paris,³⁶⁰ has studied the cause of this very curious affection, namely, an arrest of the movement of the finger until a special effort is made, when it is completed with a jerk. Menzel had held that this was due to a narrowing of the sheath of the tendons; but Poirier failed to find any such narrowing, and found certain changes in the joint which resulted in the development of an eminence upon the smooth surface. The radius of motion was lengthened by the riding of the bony surface upon this eminence, and all lateral ligaments were put upon the stretch as this was accomplished, when, as the eminence was passed and the obstacle overcome, the tension suddenly relaxed and the movement was completed with a jerk. Klemperer,⁶⁹ reporting a case, holds, however, to the earlier view of a narrowing of the sheath of the tendon and a thickening of the tendon itself. Steiner³⁴ also holds to Menzel's view, and claims to have cured a case by the local injection of antipyrin.

MUSCULAR SPASMS.

Unverricht ³²⁶_{v. 46, p. 413} has studied the subject of tonic and clonic spasms in the epileptic attack. He reports them to be only manifestations of a single symptom, and finds that they operate according to the place of irritation. He denies the theory of Ziehen, that clonic contractions are due to an irritation of the cortex and tonic contractions to an irritation of the infra-cortical ganglia, and supports this view by the result of experiment.

Schott ⁶⁰_{Aug. 30} reports a case of the stretching of the facial nerve in facial tic which was unsuccessful. He has collected 19 cases from literature, in 2 of which there was recovery and 11 of which were completely unsuccessful. Various cases of spasm of individual muscles are reported, but they contain little that is new and are without special importance.

Leuch ²⁰_{v. 121} describes a case of periodical contractions where the patient had attacks resembling tetanus, lasting from one-half to twenty-four hours. They seemed to be entirely distinct from tetany and from hysteria. Féré ⁴⁵²_{July, Aug.} describes a curious retraction of the upper eyelid, similar to that seen in Graves's disease, but without any other sign of that affection, occurring in epileptic patients.

SPASMUS NUTANS.

Caillé ⁵¹_{Mar.} reports 2 very interesting cases of apparent choreic movements of the head in rachitic babies, where there was also nystagmus. On careful examination, however, the movements were found to be probably voluntary, and due to the efforts which the child made to counteract the movements of the eyes. Keeping the eyes bandaged caused a complete cessation of the movements. Rotch, in the discussion, reports 2 similar cases which recovered spontaneously. Hadden ⁶_{June 14, 21, 28} reports various cases of head-nodding and head-jerking in children, which are usually associated with nystagmus of one or both eyes, which may occur simultaneously with the onset of the head movements or may precede or follow them. In some cases there was a momentary loss of consciousness with the seizure, but in none of these cases was there a family history of convulsions, nor did it seem possible to refer the cause to faulty feeding, rickets, or dentition. Hadden believes that the head-nodding may be regarded as a disarrangement of movement; that the movements of the head and eyes are

purposive, and usually become perfectly co-ordinated very early. Cases are also reported by Rex⁵¹_{Oct.} and Neirelles,⁵³⁸_{Nov. 22} who claims to have cured his case by vigorous massage to the spine.

PROFESSIONAL CRAMPS.

Bruns⁷⁵_{June 15} calls our attention to quite a new variety of professional spasm. The patient was a drummer, who was accustomed to practice about five hours a day. After about five months he began to have a slight pain in the forearm and ball of the left thumb; two weeks later the thumb suddenly became immovable, and Bruns found there was complete paralysis of the left flexor longus pollicis. The fingers of the hands were otherwise but little disturbed; the muscles did not respond to either current. Under massage and electricity a little power returned to the thumb. Bruns has made a careful study of the muscles involved in drumming, showing why special strain comes upon these muscles in the left hand. Poore⁶_{Oct. 16} reports a case of tailors' cramp where there was a slight neuritis, and one of tremor and weakness in the arm in a gold-beater. Wolff²_{July 29} describes his treatment for writers' cramp, namely, massage and gymnastic exercise. The real secret, he claims, is to act upon the psychical centre—that is, upon the morbidly affected will of the patient—and to draw his attention from the affected point. In this way, he thinks, the patient may gradually lose his nervousness, which is indispensable in effecting a cure.

THOMSEN'S DISEASE.

Hale White⁴²⁸_{v. 46, '89} reports a very interesting case of this affection, where there was increased mechanical excitement of the nerves and muscles, but where the electrical excitability was normal, except that the contractions of the muscles were of long duration, and A. S. Z. was in some muscles obtained as readily as or even more readily than K. S. Z. Examination showed the muscle-fibres to be thicker than usual; striation was indistinct, and the boundary of fibres slightly irregular and curved. White summarizes the reported cases, and shows that the etiology is still unknown, but that the hereditary character of the affection is marked. The first symptoms are usually noted in childhood. The disease is much commoner in males. The affection is, probably, permanent. It is characterized by a peculiarity of movement

noticed only at the commencement of voluntary movements, and consists in the fact that the contractions of the muscles are slower than normal and relaxation is gradual. The muscles of the extremities are commonly affected. There is no record that the involuntary muscles are ever attacked. The bulk of the muscles is increased, but the strength is somewhat deficient. Mechanical stimulation of motor nerves is normal, but mechanical stimulation of the muscles causes them to contract slowly and relax gradually. Contractions induced by either kind of electric current slowly attain their maximum and relax very gradually. Tracings showed peculiarities of contraction and relaxation, and demonstrated that they persist much longer in a series of movements than might be expected. The difficulty of movement is usually increased by mental excitement and cold, and decreased by alcohol, digestion, and warmth. Examination showed the fibres to be wider, the striation indistinct, the border of the fibres curved, and the nuclei increased. There were no sensory symptoms. Treatment is of no permanent effect and recovery probably never occurs. There are four theories of the disease: congenital malformation of muscular fibres; functional disturbances of the psychomotor centres; affection of motor tracts and nerves; primary affection of the muscles. Erb⁴¹_{Feb.24} reports 5 new cases, and dwells again upon the myotonic reactions which he has previously described, namely, the increased mechanical, faradic, and galvanic excitability of the muscles, and the appearance of dimples and furrows on direct irritation, the long duration of the contraction, and the rhythmical undulatory contractions; these he believes to be constant, and where they have not been found it has been due to the employment of too weak a current. Other authorities have usually failed to find some of these symptoms, but Seifert⁴¹_{Feb.24} reports a typical case in which he also found them.

Jolly⁷⁵_{July 15} has found Erb's electrical reactions in this affection, and he finds that if the muscles are repeatedly irritated by electricity, without any long pause, the duration of the contractions become shorter and shorter, and finally the after-duration disappears entirely, showing an action to electricity similar to the action to voluntary impulses. Jolly is disposed to assume that in Thomsen's disease irritating substance is formed of greater amount, and is carried away less rapidly than in normal muscles.

Shaw⁹⁸_{Jan.} reports a case which he believes to be one of Thom-

sen's disease from the fact of tonic spasm attacking the muscles at the moment of a willed movement, without pain, and continued until overcome by repeated volitions. The electrical reactions, however, were absent.

Moyer ⁹_{Aug.16} thinks that the symptom of spasm at the beginning of voluntary impulse does not alone constitute Thomsen's disease, and that it may occasionally be associated with other affections, although it is distinctly rare. He reports a case which he believes to have come on in an adult, without special heredity, but from the excessive performance of certain muscular acts. Other cases are reported by Cook and Sweeten, ²_{Jan.11} Ross, ²_{Feb.22} Herschell, ⁶_{Feb.1} and Greenfield, ³⁶_{Nov.}

TETANY.

In the past year several interesting studies of tetany have been made. Von Jaksch ¹¹⁴_{V.17, Supp., p.144} describes a special form of this affection, which he regards as a recurring form, usually coming on in the spring as an epidemic, and affecting men of the working-class between the ages of 17 and 18. The facial phenomenon is the most constant. Out of 35 cases fever was present in 9. In those that were free from fever the temperature was usually normal. Von Jaksch considers this form of tetany as infectious. The forms which are free from fever are to be regarded as chronic forms, and constitute a second group. A third group is made up of cases where the symptoms of tetany come on in the course of some severe brain disease. Von Frankl-Hochwart ³⁹⁰_{V.9, p.129} has shown that in tetany faradic excitability may remain normal, and that the facial phenomenon may be absent. He has also settled the old question whether Trousseau's phenomenon was due to pressure on the nerve or on the vessels by experiments on animals. Having produced tetany in dogs by extirpation of the thyroid, he succeeded in bringing on the spasm, having laid bare both nerve and artery by pressure on the nerve, pressure on the artery having no effect. In 3 cases he has observed with an increase of the spasm a certain confusion, excitement, and hallucinations.

Eiselsberg ⁸⁴_{Sept.29} has studied the question of the effect of total extirpation of the thyroid. He found in animals that total extirpation or exclusion of the thyroid, by tying the vessels, has caused tetany, which usually proves fatal. If the two halves of the thyroid are removed by two operations several weeks apart, and the

first half put back into the abdominal cavity before the second is removed, the animals remain alive. He considers that tetany and myxœdema are allied, and that tetany may pass into myxœdema. He regards tetany as an acute form of mucin poisoning and myxœdema as a chronic form.

Schlesinger²⁸³_{Nov. 30, '59} agrees with von Jaksch in distinguishing an epidemic form of tetany, but separates the other forms, not on account of their course, but on account of their etiology. These other forms he considers not as independent affections, but merely symptoms of some form of poisoning, and speaks of them as pseudo-tetany. He thinks that the cases of mucin poisoning and the other forms of pseudo-tetany may be distinguished in various ways from the epidemic affection.

Escherich⁸_{Oct. 2} has studied 30 cases in young children who presented symptoms of tetany. These came under observation chiefly in the months of March, April, and May. Sixteen of them were under careful observation in the hospital. They were children from 8 months to 2 years of age. They presented the contractions on pressure on the nerves, the twitching of the face on striking certain spots in the cheeks, the mechanical excitability of the nerves, increase of electrical excitability, and the intermittent, typical, tonic contractions of the extremities. In addition, all but three of the children had laryngospastic attacks. He considers the prognosis of this form of tetany favorable except where the laryngeal symptoms become dangerous. The treatment is chiefly by tonics and codliver-oil. In the discussion, Rauchfuss considered the chief cause of tetany to be rachitis affecting the skull, but Escherich considered that tetany was a typical disease, affecting only healthy children, and that in many cases there was no rachitis. Hoffmann³²⁶_{V. 43} agrees with Munk that extirpation of the thyroid is an important factor. He did not consider that the disappearance of Trousseau's sign was an indication that the disease was at an end. He classified the affection into three groups: abortive cases, which cease after one attack; cases which last several weeks, the contractions appearing in groups, with longer or shorter intervals; cases which recurred after an interval of several weeks, during which no evidence of the disease could be made out. The symptoms noted were change in the finger-nails, falling out of the hair, and a brownish pigmentation of the hands and face.

Chvostek¹¹³_{Oct.19} finds that in tetany there is also an increased mechanical and electrical excitability of the sensory nerves, shown by the lesser strength of current required and the shortness of the interval. Although the auditory nerve reacts normally to electricity only in 15 per cent. of the cases, it reacted in 6 out of 7 cases of tetany examined.

Kahler⁵⁷_{Nov.17,'89} considers that a latent tetany is very common, and that any extraordinary excitement may produce it in persons who are apparently healthy. He considers the prognosis favorable only so far as the cases proceed favorably, but the disease may exist for years, and in some cases severe nervous actions may follow the tetany.

Kaspárek⁸_{Oct.30} reports a case presenting the typical symptoms, the attacks coming on in a man after a sun-stroke, and being associated also with attacks of unconsciousness and persistence in length of the intervals, and with spasm in the muscles on voluntary movement.

Abrams¹⁴⁷_{Jan.} describes an interesting case where the paroxysms were on one side; the extensor muscles were alone involved, and the patient had also dilatation of the stomach.

Schneck⁶¹_{Sept.13} reports a case where there was an absence of tendon reflexes and Argyll-Robertson pupil, both of which disappeared with the contractions.

CONVULSIONS.

Hughlings Jackson, of London,⁶_{Mar.29} in the Lumleian lectures for last year, states that convulsions and other paroxysms are due to excessive and other temporary discharges. Convulsions differ in kind according as the centres discharging differ in rank; that is, the centres first engaged in paroxysms make up different evolutionary levels of the central nervous system. The lowest level consists of the cord, medulla, and pons; the middle level, the centres of the Rolandic region; and the highest level is made up of the centres of the præfrontal lobes. In the lowest level the fits are the so-called respiration fits, the fits produced by convulsant poison, and the fits which come on in consequence of certain injuries of the cord or nerves. The fits of the second order he regards as epileptiform, and in these consciousness is usually lost later. In fits of the first order consciousness is lost very early. He dwells at some length upon the various nerve-tracts and their importance in the production of convulsions.

Bullard ⁹⁹_{Mar. 29, 27} reports 5 cases of paroxysmal running in children. This may be in a straight line or in a circle. It may be apparently purposive or irregular, depending upon some idea or hallucination. He divides the cases of paroxysmal running into two classes: those associated with severe disease, epilepsy, or nervous derangement, or those in which it occurs in simple disease, chorea, hysteria, or even by itself, as the only pronounced manifestations of a temporary psycho-neuroses. He considers that the character of the running does not give any information as to the severity of disease, but that the symptoms are of a grave and serious nature, and should never be neglected.

PARALYZING VERTIGO—GERLIER'S DISEASE.

Ladame ⁴⁷_{p. 48} has made a careful and very exhaustive study of this curious affection, which was first described by Gerlier, and which seems to exist only in a very limited locality. It is observed in certain districts of Switzerland, showing a tendency to spread like an epidemic into the neighboring villages, and disappearing with the onset of cold weather. The three pathognomonic symptoms are muscular resolution, cervical pain, and ocular disturbance. There are apparently three distinct types of the affection: one where the patient appears to be blind drunk, one where he is in a state of contemplation, and one where he seems to be asleep while standing up. The muscles are weak, the pains are not constant in character, and individual patients vary greatly in different attacks. The pain may occur almost anywhere. The only objective symptoms were in the eye—ptosis. An attack may sometimes be produced at will by making the patient look steadfastly at a bright object.

Ladame gives 9 cases of the affection, which were reported by Gerlier and Haltenhoff. The cause is still distinctly obscure. Gerlier seemed to think it was due to some infection in the cow-sheds, as it always attacked the farm-hands there employed. Ladame, however, thinks that the etiology is very complex. He believes that a very important factor, which has thus far been overlooked, is the contagion of fear in a locality predisposed to it by superstition; and nervous influences seem to play a considerable part, although the unhealthy state of the cow-sheds, exposure to the sun, alcoholic and other excesses, also have a share

in causing the disease. Auto-suggestion was also regarded as important.

TREMOR.

Hysterical Tremor.—Charcot ⁷³_{Sept.6} has recently published a clinical lecture on hysterical tremor. He considers it more common in men, and may resemble every kind of tremor associated with organic disease. He classifies tremors as those which are not exaggerated by voluntary movement, which may be oscillatory, as in paralysis agitans and senile tremor, or vibratory, as in Graves's disease, alcoholic tremor, and general paralysis. In the second class are tremors provoked or exaggerated by voluntary movement, as in multiple sclerosis. Hysterical tremor may assume any one of these forms, and it may be general or local. It is always necessary to look out for other hysterical manifestations. If the tremor appear after a fit, it is of special importance in determining hysteria. When the tremor diminishes, it may be increased by pressure on the hysterogenetic points. Dutil ⁴⁵²_{Jan., Feb.} has also made a careful study of this symptom in hysteria. He considers that the tremor may develop very insidiously or suddenly, under the influence of fright or moral shock, and still more frequently after a convulsive attack. It may begin with a true attack of trembling. He classifies the cases, according to the rapidity of the trembling, into three groups, the oscillation varying from four to twelve a second. Those with rapid oscillations, eight to twelve a second, may closely resemble the trembling in Graves's disease, alcoholism, and general paralysis. The trembling in general paralysis and alcohol, however, is due to a trembling of the fingers; in Graves's disease to a trembling communicated to the fingers by the arm. In order to distinguish hysterical trembling from the trembling in Graves's disease, it needs the evidence of other symptoms of either affection. Grasset ⁹¹_{Sept.} has made an elaborate clinical study of hysterical trembling which he compares to tic convulsif. Delmas ¹⁸⁸_{Oct.12} also reports a case. Moussous ¹⁸⁸_{July 20} reports a case of intention tremor, probably hysterical.

Senile Tremor.—Sacaze ³_{Sept.10} has studied 23 cases of tremor of different origin, in old people between the ages of 60 and 85. Trembling in the aged is due to several causes, such as heredity, hysteria, or excessive use of tobacco; but he thinks that a purely senile tremor does not exist. The rôle of arterio-sclerosis in the

etiology of the trouble is still undetermined. It is scarcely possible in diagnosis to lay much stress upon the form of the oscillations or their number per second. The appearance of all these tremors, among other indispensable conditions, seems to exact a certain muscular contraction more marked than ordinary tonicity. Three interesting cases of hysterical tremor in old women are also reported.

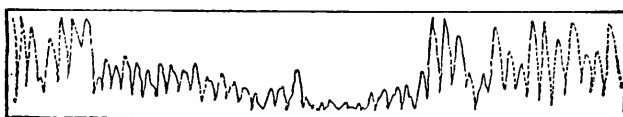
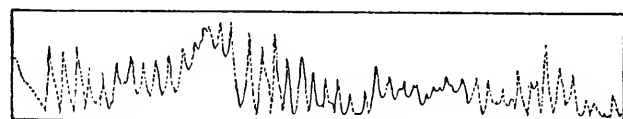
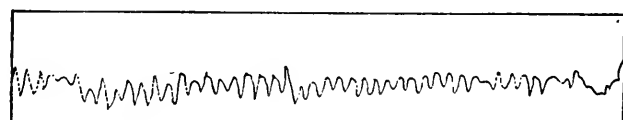
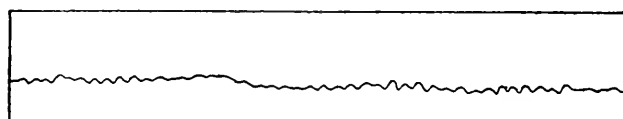
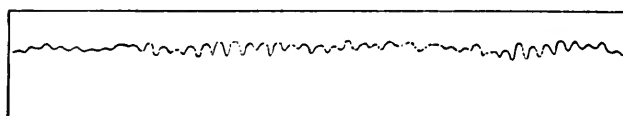
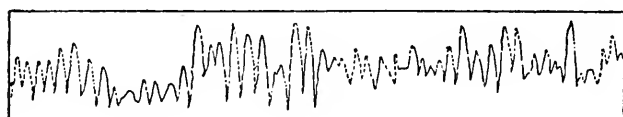
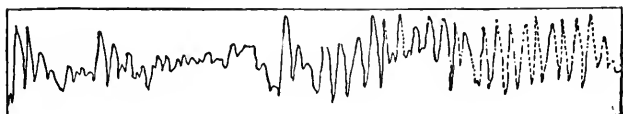
Hereditary Tremor.—Nagy ⁷⁵_{Sept. 16} reports a case of hereditary tremor coming on in a young girl, where, out of 41 members of the family, 19 suffered from tremor.

PARALYSIS AGITANS.

Borgherini ⁵⁹¹_{v. 15, No. 1} has recently made an admirable study of this disease, based on 4 cases under his own observation, 1 of which came to autopsy. He lays much stress upon the neuropathic taint, clearly present in 3 of his patients, as a predisposing cause. He also cites a family where 7 out of 9 children had the disease, and it was present in 3 of their descendants in the next generation. Trauma, rheumatism, and, above all, psychical disturbance, are important as exciting causes. The tremor usually begins in the right hand, but in 1 of his patients, who was left-handed, it began in the left. In all his cases the head was involved, and disturbances were noted in several of the cranial motor nerves. The tremor is distinctly modified by psychical disturbances; and this, he thinks, does not militate against the theory of a cortical origin of the disease. Respiration is often slower and the pulse is sometimes more rapid. The temperature was not much affected, but in most cases the subjective feeling of heat, described by Charcot, was present. Sensibility and reflexes are usually normal. The muscles are often in a state of exaggerated tension, which, like the tremor, can be partly but not wholly controlled by the will. The muscular force is diminished, and the rapidity of movement, as shown by counting or tapping, was greatly impaired. The latent period of contraction to the electric current was increased, as Mendelsohn has noted, and there was a quantitative diminution; the resistance of the body was probably increased. The urine contained rather more urea and distinctly less phosphoric and sulphuric acid than normal. Borgherini regards the propulsion, pro-lateropulsion, or retropulsion as of a mechanical character, and

due to the inclination of the body. In the autopsy reported there were found an increase of nuclei in the walls of the vessels of the brain and cord, especially in the pons, and changes in their calibre; a slight inflammatory thickening of the pia; a thickening of the ependyma of the fourth ventricle, with an increase of connective tissue in the gray matter of the pons and some atrophy of the gray matter. In the cord itself signs of perimyelitis were more conspicuous, and in the pyramidal tract there was considerable increase of connective tissue. The central canal contained many nuclear elements and the vessels were much altered. A similar increase of connective tissue was noted in the nerves, muscles, and sympathetic ganglia. In the latter was seen a pigmentation of ganglion-cells. Similar muscular changes were noted in a bit of muscle excised from another patient. The important changes were those of the vessels and the hyperplasia of the interstitial tissue, affecting the nerve elements; the latter affected the motor regions chiefly. Other autopsies are cited, and the author agrees with Vulpian, Demarge, and Tessier, that paralysis agitans has an anatomical basis. It cannot be regarded as systemic, but rather diffuse, affecting the gray axis and the white matter of the pons, medulla, and cord. Peterson¹_{Oct. 11} has made a clinical study of 47 cases, 40 of which came under his personal observation. In a majority of cases it developed between the ages of 50 and 60; 29 of the cases were in men and 18 in women. In only 2 did a hereditary taint seem to have any influence in bringing on the disease. Exposure, anxiety, and injury seem to have been the principal causes. Tremor was present in every case, beginning in 20 cases in the left and in 18 in the right arm; in 6 cases it began in the feet; in 9 cases the head was also affected. Rigidity was present in 41 cases, in 1 case affecting the muscles of the mouth so that the patient had no control over it. Eighty per cent. of the cases presented the typical contractions of the disease. Tracings were taken of the rate of tremor (see pages 72 and 73). In 1 case the patient showed some muscular atrophy. Propulsion was observed alone in 12 cases, retropulsion in 3, the two combined in 9, and lateropulsion in but 1. In 15 cases there was no peculiarity of gait; in 13 cases there was some affection of speech, which was probably due to a rigidity of the muscles concerned in the process. The special features were monotony, a high-pitched,

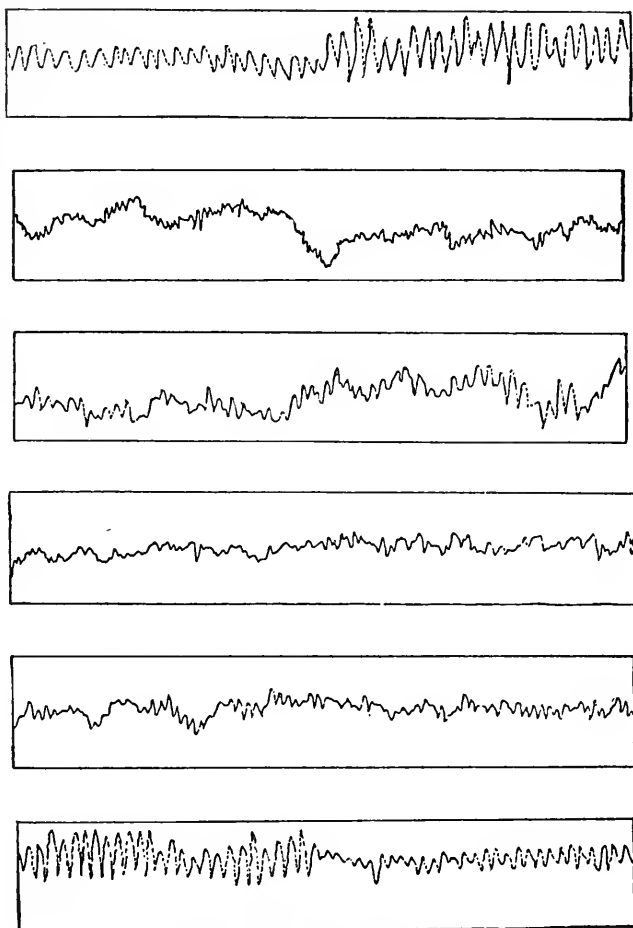
piping quality of voice, and a suspicion of festination in the speech. In 7 cases there was a subjective sensation of heat and in 5 of cold. In 1 case, where the subjective sensation of heat



PARALYSIS AGITANS. (PETERSON.)
(*New York Medical Journal.*)

existed in one spot, there was a distinct increase of the surface temperature in that spot. In only 1 of the 47 cases was there any distinct mental disturbance, although naturally many of the patients

were somewhat depressed, and there was at times some mental weakness due to their age. Peterson has found some benefit in checking the tremor from hyoscine ; he has also found that codeine will often relieve the discomfort and restlessness.



PARALYSIS AGITANS. (PETERSON.)
(*New York Medical Journal.*)

ALCOHOLISM.

Meynert⁸_{Feb.6} compares delirium tremens with other forms of confusional insanity, and considers it a form of amentia which may come on in the course of chronic alcohol poisoning. There are also forms without confusion, which may be regarded as a toxic

paranoia. The action of the alcohol is upon the blood, affecting the projection system; sometimes in the first stage there is sleeplessness, followed by conditions of anxiety and hallucinations and dream-like conditions. The distinction of these hallucinations from other forms of confusional insanity consists in the frequency of tactile hallucinations, the multiplicity and the mobility of the images. Delirium tremens is regarded as an acute condition of irritation and destruction coming on in chronic alcoholism, and is analogous to another form of amentia, namely, that seen in hydrophobia.

Garnier¹⁵²_{May 9, 16} has studied alcoholic delirium, and defines it as an attack of delirium due to a former intoxication, beginning with insomnia, and consisting of hallucinations, which may be multiple, mobile, and painful, and accompanied by more or less general trembling, with increased anxiety and agitation at night. In the hallucinations the danger seems to threaten immediately, and the patient is led to fly in a panic of terror. This terror may sometimes closely resemble nightmare, and in rare cases it may be followed by a cataleptic condition, where the patient, from his terror, is unable to move. Dagonet³⁶¹_{v. 10, p. 193} has also called attention to the analogy between alcoholism and dreams. The conscience is troubled; there is suppression of reflection and judgment; the patient responds passively to his hallucinations, and has all manner of strange ideas. Aufrecht⁶⁵⁰_{Oct. 8} advocates the use of chloral in alcoholic cases.

CAISSON DISEASE.

Corning⁵⁹_{May 10} has studied a number of cases of caisson disease in the workmen employed on the Hudson River tunnel. The most constant symptom, and usually the initial symptom, was pain, followed by loss of power and anæsthesia. These symptoms may go on and other symptoms develop, presenting the picture of acute myelitis, and cerebral symptoms may sometimes follow. The early symptoms are relieved if the patient at once returns to the caisson. The symptoms are considered to be due to the abrupt transition from an atmosphere of a high density to one relatively rarefied, and similar symptoms have been noticed in aeronauts who ascended to great heights, which immediately disappeared when they descended to lower levels. Corning advances no new theories in regard to the pathology of the disease. As regards treatment, he has employed morphine and electricity with benefit, but he believes

the best remedy is to return the patient as quickly as possible to the compressed air; and thinks it advisable to have a chamber of compressed air in the neighborhood of the caisson for the treatment of the victims, and also that the process of locking out be made longer.

FUNCTIONAL AND ORGANIC NERVOUS DISEASES.

Oppenheim⁷⁵_{Aug.15} has carefully studied certain cases of organic nervous diseases where functional disorders manifested themselves; one, a case of multiple sclerosis, where there was also hysteria, another case where *tic convulsif* developed in a patient with sclerosis, and also cases of typical facial paralysis developing with genuine hysteria. Pitres⁵⁵_{Sept.20} reports a case of pseudo-tabes of hysterical origin, where there were various symptoms precisely similar to those of tabes, especially the pains and ataxia. He quotes 10 cases of the affection in which the striking features were the ataxia and pains, but there were also symptoms of hysteria; and the objective symptoms of tabes, the loss of knee-jerk, the changes in the pupils, and the optic atrophy were wanting.

FUNCTIONAL NERVOUS DISEASES.

Herzog³⁶⁸_{v.21,p.271} speaks of the infectiousness of neuroses and reports 2 cases. He considers the transmission as a symptom of irritable weakness, and accordingly a part of the nervous predisposition, but that in other cases it is a symptom of already pronounced disease. Kousnezoff⁴⁷_{p.3} has produced cerebral hyperæmia in animals and found the following changes: Hypertrophy of the interstitial tissue, both in the vessels and neuroglia, the latter being found thickened in the other parts of the cord; the cells, both in the brain and cord, were increased in number and also in size; degeneration of the nervous tissue had taken place; the cells were more or less swollen; the protoplasm was pale, granular, and at times vacuolated; the nerve-fibres were also degenerated, and the changes in general bore an inflammatory character. The chief reason of the changes was a hindrance of the circulation in the smaller vessels. Hughes⁹⁸_{July} calls attention to the fact that many of the lesions in nervous diseases are not, strictly speaking, due to changes in the nervous tissues themselves, but to changes in other parts either of the blood-vessels or connective tissue outside the nervous tissues. Mackey²_{Nov.22} attempts to classify a certain set of cases, occurring between the

ages of 30 and 40, where the symptoms were irritation, debility, and disinclination to make any effort. In men there were also insomnia, depression, plethora, and a pulse of high tension, but in women there were often anaemia, menorrhagia, and a pulse of low tension. Thomson²¹²_{Apr.} considers that functional nervous diseases are not due to any molecular or chemical change in the nervous system, but to disordered sources of nerve-energy, and thinks that probably the disturbance is due to some poison in the blood whose origin, in very many cases, comes from some disturbance in the gastro-intestinal tract. Jamieson²⁸⁵_{May} assumes, as every one must, an organic basis for all nervous diseases, and considers the distinction between functional and organic diseases as merely arbitrary. There may be an early and functional and a later and organic stage, not only in the same case, but in different cases of the same disease. Lawrason¹²_{Sept.} dwells on the importance of vasomotor disturbances in many cases of neuroses, and advises treatment whose aim is to benefit nutrition by dilating the vessels. Clouston⁶_{Nov. 15} discusses neurosis development. During the period of growth he thinks that cells do not energize in the same way that they do after growth is completed; that there is a distinct difference both in the period of increase in bulk and the period of increase of function. An individual organ may come to perfection before other organs are developed. We are not able to demonstrate any changes in the brain of a young man of 15 and the man of 25, but the functional differences are indisputable; hereditary defects are brought out during the stage of formation, the stage of most rapid brain-growth, the period of co-ordination, of motion or emotion, and, finally, in the period of puberty, which is characterized by neuroses especially affecting the mind.

NEURASTHENIA.

Little that is new in the study of the pathology, the symptoms, or the treatment of this condition has been published. Kowalewsky⁶⁸_{Sept.} has advanced a theory as to the nature of this condition. He considers that, when the nervous system does an excessive amount of work, sufficient nutritive material is not brought to the centres of activity, and, furthermore, by the continuance of their activity, the waste products are not carried away as speedily as they should be. This leads on the one hand to malnutrition, and on the other

to intoxication from the waste products. In certain conditions, moreover, he holds to Arndt's theory that many of the cell elements in the nervous system of some patients show a defective development. In such cases neurasthenia is more nearly a congenital condition, and is, of course, much more easily developed. By the first theory he explains the injurious effects of alcohol, opium, and improper food. Bordarie⁷⁰_{p.359} advances a similar theory, basing the condition upon a vasomotor disturbance and excitation of the vasomotor centres, leading to a diminished nutrition and a consecutive intoxication. In some cases with depression, however, he maintains that morphine sometimes gives excellent results. Bouveret¹⁰⁴⁰ insists upon certain symptoms which he thinks deserve the name of neurasthenic stigmata, which may be compared to the stigmata of hysteria; these are headache, insomnia, cerebral depression, general weakness of the motor powers, rachialgia, and atonic dyspepsia. He also regards as important signs an habitual dilatation of the pupil, which reacts more feebly to the light, and discolored and cold hands and feet. Hypochondria is very common in these cases. True anæsthesia is very rare, but hyperæsthesia is very common. He considers it important to distinguish between the cases where cerebral symptoms are most prominent and those with marked spinal symptoms, for in the latter physical exercise is injurious. Le Gendre²⁹⁰_{Mar.11} thinks that Bouveret pays too little attention to digestive disturbances as a cause of the trouble. Interesting papers have been published by Hirt¹¹³_{Sept.8,15,'89} and Gorham,⁵⁷_{Sept.15 to 29,'89} but they contain little that is new. Carron de la Carrière²⁴_{Nov.24,'89} speaks of the frequency of dilatation of the stomach in neurasthenia, and maintains that local treatment is of little benefit, but that the condition improves on general treatment. Dujardin-Beaumetz²⁴_{Nov.24,'89}⁴_{Aug.4} also discusses the frequency of dilatation of the stomach in neurasthenia, but advises local treatment as in dilatation from other causes. Bernhardt²¹⁴_{Sept.1} has studied the field of vision and the changes in the optic nerves in neurasthenia and hysteria. He finds the fundus of the eye usually normal, but the field of vision usually shows a concentric limitation in both affections, which he considers precisely similar to that found in beginning atrophy of the nerves. In such cases he considers that the calibre of the arterics is of great value in diagnosis, as, of course, they are much smaller in beginning atrophy. Hermann⁶⁵_{Feb.} advocates the term of peripheral neurasthenia

for the cases of numbness of the extremities. Cutter⁸¹_{Feb.} thinks that the presence of colloid discharge in the urine is an important symptom as showing a cause of neurasthenia in men. Schott¹¹³_{Mar.16} thinks that the cardiac disturbance in neurasthenia often leads to a weak condition of the heart. Müller²⁷⁸_{Apr.} advocates warm, dry sand-baths as being the simplest method of warming the body throughout, and as a distinct benefit in neurasthenic conditions.

ANOMALOUS NERVOUS CONDITION.

Brissaud,³_{Nov.12} in a carefully prepared article, considers that the paroxysmal anxiety, or so-called præcordial anxiety, or, strictly speaking, an apprehension of extreme danger, the meditation of death, is much more a mental state than physical. He considers that, as it is seen most frequently in diseases of the chest, it is probably due to a disturbance of the centres in the medulla by irritation of the branches of the vagus. Harley²_{Nov.22} reports 2 cases with severe nervous symptoms—insomnia, diminution of the reflexes, and marked muscular prostration, followed by coma and death. These symptoms were associated with ischuria, and the urine was dark red and contained abnormal coloring substances of the chromogen group.

Bernhardt⁷⁵_{July 1} reports 4 cases of patients who complained of very peculiar prickling and burning in the tongue, which was quite distressing and led to the fear of cancer. Piotrowski⁵⁶⁹_{No.35} also reports similar cases. Wolff⁸¹_{Apr.} reports 4 cases of peculiar nervous symptoms in children, attended by dilation of the pupils, rapid action of the heart, and delirium, alternating with a condition resembling stupor. The condition is very transitory, and the cause was not apparent. Robert⁴⁵⁶_{June 25} describes a curious case of a young man who could not see the sun without being drawn toward it by an irresistible force; the eyes were widely opened, the pupils dilated, the respiration became panting, he lost sensibility, and was taken with convulsive movements. When taken out of the sun he immediately became calm.

REFLEX NEUROSES.

In the description of the treatment of chorea (p. 56, this section), reference was made to the report of the New York Neurological Society and to the theories of Stevens. Starr⁵⁹_{Jan.4; Mar.22}

has published two interesting papers upon this subject. In spinal diseases he considers that the reflex mechanism is too important and too stable to be affected by slight causes; in cerebral affections, however, slight causes may produce defective control. He considers that when peripheral irritation is an actual cause of a neurosis, nature indicates it by attracting attention to the seat of irritation by discomfort or pain. He believes that the great majority of patients who present symptoms of reflex neuroses have been exposed to influences which undermined the strength and nutrition of the entire nervous system, that they have a defective control, and are not the victims of irritation of some peripheral organ. He considers, moreover, that although peripheral irritation is rare, still it may produce a condition resembling epilepsy or chorea; but yet the symptoms differ distinctly from those of the idiopathic affections. As regards the eyes, he thinks that the power of the ocular muscles varies considerably in healthy persons from time to time; that a strain of the muscles produces discomfort in the eyes, and that a slight ocular insufficiency very rarely produces discomfort, although such cases may occur. The symptoms arising from peripheral irritation he thinks present characteristic features, and he also believes that as serious irritations of the genital, ovarian, intestinal, nasal, and auditory organs are not common in nervous patients, so irritations of the eye are probably equally infrequent, and he does not believe that true epilepsy or chorea can be produced by ocular strain or cured by its relief.

Baruch,⁹_{July 12} admitting the possibility of neuroses caused by peripheral irritation, considers that in such cases we have easy means of detecting their existence, especially in reflex neuroses from disturbances of the eyes or nose. In regard to Stevens's theories, he cites observations of Roosa, who found that in healthy persons 84 per cent. have want of equilibrium of the ocular muscles. Baruch, furthermore, urges that all harmless methods of treatment should be exhausted before mutilating measures are adopted, and that whenever there is a doubt the local conditions should receive the benefit of the doubt, and treatment should be directed to the improvement of the general health. Babcock⁵⁹_{Aug. 2} considers that reflex neuroses are rare, and reports 3 cases where the disturbances were undoubtedly due to such conditions. Church and Colburn¹¹⁵_{Apr.}

discuss Stevens's theory and Colburn is a firm believer in it. Out of 385 cases of headache he claims to have cured 260 and benefited 118 by treatment of the eyes. He has cured 5 out of 7 cases of epilepsy and 9 out of 11 cases of chorea. Equally good results were obtained in recurrent headache, migraine, and neurasthenia.

TREATMENT OF NEUROSES.

The most important contribution of the year on this subject is certainly the valuable lectures of Seguin.¹ Mar. 29; Apr. 5, 26; May 31 In the treatment of epilepsy he considers that various secondary conditions play some part in the genesis of the attack, but the true cause of the disease lies deeper and is still unknown. Therefore, he urges that, although it is well to remove these secondary causes if possible, the general treatment must never be omitted. He believes that treating the ocular defects of epilepsy will not cure epilepsy, although it may reduce the sum-total of the exciting causes of the attacks. In both symptomatic and idiopathic epilepsy he considers that the systematic use of bromides is practically the only treatment. A cure can be obtained only in an exceedingly small number of cases. In giving bromide he urges the necessity of long-continued observation of the patient. Children can bear larger doses in proportion than adults. The existence of organic heart or brain disease increases the susceptibility to the drug. He insists it should be given largely diluted, and that it should also be administered with reference to the time when the seizures most commonly occur, and that the dose should be increased before any unusual strain, or in young patients at the approach of puberty. After the patient has been three years without any manifestation of the disease, it is safe to begin to diminish the dose. He thinks that a distinct therapeutic bromism is to be produced and kept up, and that pathological bromism is to be avoided. In cases where bromide is not well borne, and when there is severe acne, he advocates giving bromide in smaller doses and to aid its use by chloral. In some cases strychnine and atropine seem to aid the action of bromide. Arsenic is of distinct value against the acne. In the treatment of chorea he considers that our main-stay is arsenic, but he believes it is usually given in too small doses. He holds it should be pushed; the doses should be from 18 to 20 drops of Fowler's solution, three times a day, to be very freely diluted with

alkaline water. Furthermore, he considers that absolute rest in bed is exceedingly important in the treatment. Exercise, in the main, is not good for children with chorea, although very light gymnastics may sometimes be of advantage. In the treatment of migraine he thinks that ocular defects are extremely common and should always be sought for with the greatest care, and he thinks that the value of cannabis Indica in large doses, and of other mydriatics, is due largely to their action upon the muscles of accommodation. In some cases, however, lithæmia plays an important part in the pathology of the attacks, and should be treated by diet, exercise, and drugs. The headache itself may be relieved by antipyrin or caffeine, but morphine should never be given. In some cases, strong black coffee, without milk or sugar, may also relieve the headache, and he believes that strong black coffee in the morning is of distinct benefit in many cases of neurasthenia and dyspepsia. In facial neuralgia he advocates the use of Duquesnel's aconitine, which should be pushed until its physiological effects are obtained. In addition to that, he gives mercury and iodide in full doses, whether there is any history of syphilis or not. In exophthalmic goitre, he advocates, in the first place, the use of aconitine, and, in the second, light bandaging of the protruding eyeballs. In the diet of patients with neuroses, he thinks that the excessive use of starchy and saccharine foods is a potent cause of oxaluria and lithæmia, and indirectly of neurasthenia, and he urges the use of fats and phosphates in the food. He dwells, furthermore, upon the importance of absolute rest and isolation and upon the intelligent use of baths and exercise, and he calls attention to the great danger from alcohol, opium, and bromides; epilepsy is the only disease in the treatment of which we are justified in deliberately producing a degree of bromism.

Birdsall²⁴²_{Sept.} urges the importance of hygienic therapeutics in the treatment of nervous affections. Rosenthal²⁸³_{p. 25} advocates diminishing prostatic irritation by the local use of cocaine as a treatment of nervous impotence. Luys²⁴¹_{Feb.} once more argues the advantages of transfer in the treatment of nervous affections. Wide³⁷¹ advocates mechanical irritation of the nerves by pressure and massage in the treatment of various organic nervous affections, such as spinal infantile paralysis and tabes.

BASILAR KYPHOSIS.

Post ⁵⁹_{Dec. 21, '89} describes certain cases of deformity of the skull where there is a distortion of the basilar process, causing a marked increase of the occipito-sphenoidal angle at the base of the skull; this shortens the base and diminishes the diameters of the skull. It has been found in cases of congenital cerebral hernia and with symmetrical cortical atrophy in infantile biptegia.

MENTAL DISEASES.

By EDWARD N. BRUSH, M.D.,

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THE year 1890 has not been unfruitful in the literature of psychiatry, and, as was true in 1889, general interest seems to centre in questions of administrative conduct of institutions for the insane, and in the general questions involved in the treatment of this class of patients.

INSANITY.

Hospitals for the Insane.—The echoes of the discussions provoked by the paper of J. Batty Tuke and the propositions made to the London County Council have not died out. The very full report of the annual meeting of the Medico-Psychological Association ¹⁶⁶_{Oct.} shows conclusively that the members of that body have no sympathy with the suggestions presented to the London Council, and the excellent address of the presiding officer, Yellowlees, effectually we hope, disposes of some of the assumptions in that report. While Yellowlees does not give assent to the proposition to construct a general hospital for lunatics which shall be officered by physicians and surgeons not specialists in psychiatric medicine, he is by no means of the opinion that hospital work and hospital organization, of a modified order to be sure, would not be a valuable adjuvant to the present system of asylum management. He showed how he had suggested in 1881 the establishment in various districts of hospitals with ample staff and fully equipped for the best treatment of recent insanity.

Perhaps for the United States the suggestion of Chapin, referred to in the ANNUAL of last year, would be more applicable, and it possesses the recommendation of economy of at least a portion of the existing institutions. He proposes the establishment, in connection with the institutions already established, of well-organized hospitals for acute cases, in which all the medical attention, nursing, etc., necessary, may be expended with a view of promoting recovery.

Nursing for the Insane.—At the meeting of the Medico-Psychological Association, ¹⁶⁶_{Oct.} referred to above, an interesting report was presented upon systematic training of attendants for the insane. This report is the outgrowth of experience and observation in the matter of training asylum attendants, and may be perused with profit by all interested in the subject. The committee recommends a scheme of instruction (theoretical and practical), examination, and registration which appears to leave little to be desired. Commendable progress has been made in the United States in this same field, and the pioneers in this direction—Cowles, of the McLean Asylum, Boston, and Andrews, of the State Hospital (for Insane), Buffalo—have developed in their respective institutions a most thorough system of instruction for attendants. At the last meeting of the Association of American Asylum Superintendents, Cowles ²⁷⁸_{Oct.} opened a most interesting discussion, or, more properly, relation of experience, in the matter of training for asylum attendants, and presented some most excellent examples of reports and written answers made by some of his nurses.

The Blood in Insanity.—One of the essays which received the medal and prize of the British Medico-Psychological Association was that of W. Johnson Smyth, senior assistant in the Kent County Asylum. The essay is entitled, “An Inquiry into the Blood and Urine of the Insane.” ¹⁶⁶_{Oct.} In his studies of the blood he noted the percentage of hæmoglobin, the number of red corpuscles, and the specific gravity. He found that in the insane the hæmoglobin percentage was always below normal. In melancholia this percentage averaged $69\frac{7}{10}$; in epilepsy, $62\frac{2}{5}$; in general paralysis, $68\frac{3}{4}$; and in secondary dementia, $53\frac{3}{4}$.

The most marked diminution in the number of red corpuscles occurred in the cases of dementia, the average being 4,070,000 per cubic millimetre. The next in order were the epileptics, who presented a corpuscular strength of 4,520,800. The cases of general paralysis gave a count of 4,700,250. As to specific gravity, it was found above normal in all instances. Normal being placed at 1055, the average in secondary dementia was $1061\frac{1}{4}$; in melancholia the lowest average was found, viz., $1057\frac{1}{5}$.

Smyth concludes, from the above figures, that in these cases the higher specific gravity, in conjunction with the lower percent-

age of hæmoglobin and diminished corpuscular strength, indicates an increased density of the blood-plasma.

Urine in the Insane.—The portion of the paper devoted to the condition of the urine is by no means the least important. In general paralysis, the author finds that the solids in the urine are increased, as is also the amount of urea, uric acid, and creatinine, as compared with results of observations made on healthy men.

At the first Congress of French Alienists in Rouen, in August, 1890, Laillier ^{Aug. 15} made a communication upon the state of urine in general paralysis. He has observed certain modifications presented by general paralysis, according to the nature of the case. In the depressive delirium which often precedes the general paralysis, the sum of the waste-products eliminated in the urine descends below the physiological proportion. In the anxious delirium one observes, on the contrary, an increased amount of solids in the urine, in spite of the insufficient nutrition of the patients. In the last period, but not in the beginning, the carbonate of ammonium is found in the urine. Laillier has never met with diabetes in general paralysis, and of his diabetic insane patients no one has become a general paralytic. In the discussion Fabret stated that in the periods of depression in general paralysis he observed polyuria and azoturia, with increase of temperature and decrease of pulse-rate; and Charpentier reported a case of a general paralysis presenting an intermittent glycosuria. Voisin and Harant, at the same Congress, gave their conclusions with regard to the urine in prolonged lethargic states: (1) nutrition is not disturbed in the hypnotic sleep; (2) hypnotism is not a pathological state; (3) hypnotism is a therapeutic measure which may be made use of without injuring the nutrition of the patients.

Fragility of the Bones in the Insane.—Numerous writers have held, and experience seems to prove, that in some forms of insanity the bones become abnormally brittle. The literature of 1890 contains references to several cases which may be added to the accumulation of evidence on this point. James Howden ^{Oct. 213} reports an interesting case of mania followed by hyperæsthesia and osteomalacia. In this patient, who died at the age of 48, it was found post-mortem that nearly all the bones of the skeleton were soft and brittle, the bones of the spine and pelvis “cutting as

easily as cheese." The ribs "were pliant, and, after bending to a certain degree, they snapped like a piece of thin cork." The only portion of the osseous system which did not present degeneration was the skull.

Froelich¹⁸¹_{Sept. 15} reports two spontaneous fractures in a general paralytic. In this case the patient sustained a fracture of the bones of the left forearm while raising a shovelful of earth. Five weeks subsequent to the first fracture, he fractured both bones of the right forearm while carrying a basket of coals. In each instance the patient asserted that he had no pain, either at the time of the fracture or during the dressing. Wagner³⁹⁰_{No. 9, p. 113} reports 5 cases in which there was osteomalacia. These 5 cases were observed during a period of six years, in which time 1500 patients passed under the observation of the author. The patients were all women, varying in age from 37 to 66 years. None of these showed symptoms of general paralysis. Constantinovsky has made an important contribution to our knowledge of this subject in an inaugural dissertation published in St. Petersburg.⁹⁰_{Oct.} He gives the results of observations and experiments undertaken in the laboratory of Ivanovsky upon the bodies of 22 persons who had been insane,—12 with general paralysis, 4 with dementia, 4 with paranoia, and 2 imbeciles. Examinations were also made of the bodies of 4 others,—1 with brain-tumor, 1 with myelitis, and 2 with tuberculosis. The author used the 4 cases last mentioned as control cases. His examinations were confined to the ribs, and comprised inquiries into their chemical composition, their fragility, macroscopical and microscopical changes. Chemically, he found that the ribs in the insane had lost weight as compared with sections of equal size in the control cases; that the proportion of organic elements had increased, while the mineral substances had diminished. After a series of tests with an ingenious apparatus, he found that the fragility of the ribs was greatly increased in the insane. Macroscopical changes were not marked, but the microscopical appearances were similar to those found in osteomalacia. The conclusion arrived at is to the effect that "in chronic disease of the central nervous system, especially in insanity, the ribs are apt to undergo very considerable morbid changes, which give rise to increased brittleness, and hence predispose the bones to fracture from the slightest violence."

ACUTE CONFUSIONAL INSANITY.

Conolly Norman, of the Dublin District Asylum, ¹⁶_{June} contributes an interesting article with cases under this head. He expresses himself at the outset somewhat dissatisfied with the term confusional insanity, but retains it for want of a better. He agrees with Krafft-Ebing in regarding the mental state as one due to exhaustion and anæmia or malnutrition of the cerebral cortex. He is inclined to agree with Wood, whose article was briefly noticed in the last ANNUAL, and places puerperal insanity and the insanities of toxæmia under this head.

It seems to us that Wood has somewhat overshot the mark in his attempt to simplify the nomenclature of insanity and its classification, and has incurred the risk of confusing distinct clinical forms of mental disorder. The term "stuporous insanity," for example, while applicable to a class of cases etiologically of the same origin, physical or mental exhaustion, disturbed nutrition or malnutrition, and auto-intoxication, conveys to the clinical alienist the idea of a class widely differing in its clinical picture from some of the cases he attempts to group together. The term "stuporous," while it describes the apparent state, is, we think, an unfortunate one. The majority of these cases are not stupid, but, on the contrary, alert and watchful. In some, an overwhelming delusion of terror dominates, as it were, the patient and prevents all attempts at spontaneity. In others, the impressions are normally received and interpreted, but response cannot be evoked. The patient is in some sense mentally paralyzed, but he is not stupid.

We doubt not, indeed we know from observation, that cases which have been classed under the head of "confusional insanity" were able to carry on distinct trains of reasoning,—starting, it must be admitted, from false premises, but arriving at distinct conclusions; and these same cases have, after convalescence, been able to clearly recall the events and ideas of the so-called confusional period.

INCREASE OF INSANITY.

A paper before the Royal Statistical Society, by Noel A. Humphreys, ⁶_{Feb. 22} discusses the alleged increase of insanity in England. Humphreys shows, from a careful examination of the census returns and of reports of Commissioners in Lunacy, that the increase in insanity in England in proportion to the population is

“due partly to accumulation and partly to more complete registration.” In explanation of the accumulation, Humphreys shows that there has been a marked decline in the death-rate during the last fifteen years. The public is startled every now and then—and occasionally, we are sorry to say, by the expressions of those who should know better—by the assertion that insanity is largely on the increase. We think that a careful examination of the facts will show that fresh cases do not occur out of proportion to increase of population, and if the accumulation of old cases due to diminished death-rate, better recognition of cases as they occur, and the importation of foreign lunatics be taken into account, the alleged increase will be satisfactorily explained.

PARESIS.

This grave malady continues to be the subject of study and observation, and the literature of the year contains some interesting contributions to this department of mental pathology. An extended article by Krafft-Ebing, ¹¹³_{Nov. 17} deserves more than a passing notice. He reviews the history of the malady, and shows that it is essentially a disease of this century, and one which is increasing. He finds, in the tendency to mental overexertion and in excesses in *Venere et Baccho*, important etiological factors, and says of the age that it has “too many nerves, but too little nerve.”

He does not add anything material to our knowledge of the pathology of the disease. The occurrence of hyperostosis cranii and pachymeningitis hæmorrhagica interna with frequent large hæmatomata is referred to among the gross lesions, as is also the changes in the pia and arachnoid. In cases of long standing considerable atrophy of the brain is observed, with the resulting hydrocephalus internus and externus. The author calls attention to the fact that the primary changes in this disease are essentially vascular. The presence of granulations in the ependyma, which the author considers almost pathognomonic, with increased serum in the ventricles, is mentioned.

Among the microscopic lesions are changes in the vessels, consisting in cell-proliferation, with thickening of the adventitia. There are also changes, degenerative in character, to be found in the neuroglia, the nerve-cells, and the nerve-fibres.

The author calls attention to the three stages which can be

usually distinguished in this disease: (1) the stage of development; (2) the stage of active symptoms,—excitement, grandiose delusions, etc.; (3) the stage of terminal phenomena, paralysis, trophic lesions, dementia, etc.

As was stated in the ANNUAL for 1889, the earlier manifestations of paresis are seldom recognized, and when noticed by the friends are, as the author states, seldom appreciated. The symptoms first observed may be epitomized as those of an exhausted and overirritated brain. The patient is more irritable and easily excited, even by trivial matters. Headache and vague ocular or auditory troubles are complained of, with, possibly, hallucinations. Soon apoplectic phenomena occur, with, however, but brief loss of consciousness and temporary paralysis. Later, speech disturbance is observed. The megalomania observed in paresis is described by the author in graphic terms, as are also the phenomena of the terminal stages of the disease. The field for therapeutical measures is a limited one. The author, however, is positive that in case of an early diagnosis efficient measures can be employed to at least stay the progress of the disease for years.

Primarily, the patient must be removed from his usual field of activity and strict quiet enjoined. Abundant but easily-digested food is to be prescribed. Iodide of potassium or sodium will be found useful, and, in certain cases, ergot. If a specific history is obtained, active antisyphilitic treatment is to be pursued.

For those cases that unfortunately get beyond the first stage the treatment is of necessity adapted to the symptoms,—in the maniacal attacks, ergotin or digitalis; in some instances, morphine or hyosine is indicated.

In the apoplectic attacks efficient diaphoresis will prove of great value, while in the epileptoid seizures chloral will be found of service. Meynert, in an article upon the course, duration, termination, and treatment of general paralysis, ³⁵⁷_{Aug-1} makes some observations upon treatment which are worthy of note. He urges against despair in these cases, and says treatment must be guided not by the unfavorable prognosis, but by a conscientious endeavor to rescue the case. He suggests that many neurasthenics carefully treated are but general paretics in the earliest stages, saved before the fatal disease has a fixed hold. He advises, in cases of suspected paresis, the continuous ice-cap, ergot, and, in maniacal cases, injec-

tions of ergotin, the wet-pack, sodium bromide, and, in proper cases, local blood-letting. The iodides should be persistently tried, even in cases where a syphilitic history is not clear.

In the Congress of the German Naturalists and Physicians, in Bremen, in September, Meschede⁷⁵_{Oct. 15} reported a case in which a patient, after a hypochondriac-melancholic precursory stage, of half a year's duration, began to show maniacal symptoms, sexual irritability, etc. On his admission to the hospital he was a typical paralytic, and later on had an hysteriform attack, sudden weakness appearing, as well as transient paralysis and anæsthesia, transient tetanic rigidity of the leg, paroxysms of crying, and flatulence. Then all phenomena disappeared; three or four weeks later a second similar attack was ushered in by paralytic symptoms, which soon passed away. Death ensued with the further development of the case. Smidt and Sioli reported similar cases.

THE RELATIONS BETWEEN GENERAL PARALYSIS AND SYPHILIS.

At the First Congress of Mental Medicine, held at Rouen, the first subject for discussion was the relation between general paralysis and syphilis. Delaporte³_{Aug. 10} opened the discussion with the statement that the etiology of general paralysis was still very unsettled, and that, although certain causes, as a nervous heredity, an alcoholic heredity, congestive tendencies, cranial traumatisms, and overwork, were now admitted by all alienists, still there were others upon which there was less agreement of opinion, *e.g.*, alcoholism, saturnism, abuse of mercury, and especially syphilis. It was for this reason that the organizers of the Congress had determined upon the first day for the discussion of the relations between general paralysis and syphilis. He concludes with the request to alienists that they should keep (1) special statistics of the presumed causes of all the cases of general paralysis under treatment; (2) statistics showing the proportion of syphilitics which they had found among the maniacal and alcoholic cases, in order to know whether this proportion was much different from that observed in the paralytics.

Dubuisson had found an increased frequency of general paralysis at the asylum of Leyme, and attributed it to the increase of alcoholism. With regard to syphilis, he found it only in 50 cases out of 1600 general paralytics, and he therefore does not believe

that it has a great influence on the development of general paralysis.

Regnier referred to a former essay presented to the Academy of Medicine in 1888, in which he showed that cerebral syphilis and general paralysis must be considered as two distinct affections, which may co-exist in the same person, but run their course independently from each other. There exists no observation which establishes without doubt that syphilis can produce general paralysis, although he admitted, with Fournier, a pseudo-general paralysis. Although Mendel found syphilis in 70 per cent. of his cases, and Régis in 318 patients arrives at similar results; still, Christian found only 15 per cent., while he himself found it only sixteen times in 176 paralytics. Without going further into details, we may sum up the statements as follows: 1. Cerebral syphilis is a distinct and independent affection. 2. The syphilitic infection has no appreciable action on the production of general paralysis. Its presence does not make the disease appear sooner, nor does it modify its ordinary symptoms. 3. Syphilitic symptoms of the nervous system may manifest themselves in general paralytics just as other syphilitic symptoms; but they are only a complication; they do not stand in the relation of cause and effect.

Régis, on the other hand, found among his paralytics about 80 per cent. of syphilitics. General paralysis, in his cases, appeared about twelve or thirteen years after infection, and it appeared the sooner the less specific treatment there had been. Most of the syphilo-paralytics do not manifest the external signs of syphilis, and so it is with their descendants. On an average, the paralytic syphilitics are younger than the paralytic non-syphilitics, and among the syphilo-paralytics the youngest are those whose syphilis is the most recent. All the clinical forms of general paralysis can be found in syphilitic paralytics, but the remissions seem to be particularly frequent in them.

Cullere, in his limited experience, found only 13 per cent. of syphilitics among his paralytics, but he himself considers this number too low. He made the same observation about the early age of his paralytics with syphilitic antecedentia, and believes that one always ought to look for syphilis in paralytics that had not reached their 35th year. But he also adds that syphilis can only act on the brain, as it does, by reason of a special predisposition,

hereditary or acquired, which makes this part the weakest of the body. Finally, he concludes that general paralysis of the syphilitics does not present a special clinical form.

Voisin objected to the conclusions of Régis and Cullere that their diagnosis of syphilis rested too much on anamnestic data, while there ought to be real tertiary symptoms present in order to make the history clear. He only found syphilis nine times in 560 general paralytics, and then it presented a clinical picture quite different from that of the common general paralysis. Rouillard remarks that the statistics of Régis do not rest on a sufficient number of observations, and that they want the microscopic proof. But even this could not explain the discrepancies in the observations of the different speakers. He believed that these differences were due to the fact that the observers did not proceed in the same manner or use the same symptoms and elements to affirm or deny syphilis. The same views held true in reference to alcoholism. Rist confirmed the statements of Rouillard, and affirmed that we were at the present time in possession of a certain method of diagnosis of a former syphilitic affection.

PATHOLOGICAL ANATOMY.

Mendel⁷⁵_{Sept. 1} describes the microscopic changes in the brain of general paralytics as follows: 1. Neuroglia: an increase of the cells, considerable increase and extension of the spider-cells (glia-cells), which latter are normally confined almost wholly to the surface of the brain, but in general paralysis pervade the cortex in its whole thickness, and are continued into the white substance. The substance of the brain in cases of long duration finally shows only a confusion of fibres (sclerosis). 2. Vessels: proliferation of the cells in the vascular walls and the perivascular spaces, miliary aneurisms, spindle-shaped adventitious spaces, enlargement of the lymph-spaces, and colloid and hyaloid degenerations. 3. Ganglion-cells: fatty, pigmentary degeneration of the protoplasm, sclerosis and atrophy, shrinking or enlargement of the cells. 4. Nerve-fibres: degeneration of the fibres in the cerebrum and cerebellum is not confined to general paralysis, but is found also in epilepsy, senile dementia, paranoia, etc. The spinal cord is mostly affected. As none of these changes are peculiar to general paralysis, the essential difference from all the other brain diseases lies in the

diffusion of the process. Where is the starting-point of the described changes? Mendel believes that the whole process starts in the vessels, and that from these inflammatory changes take place in the neuroglia, which leads to destruction of nerve-fibres and changes in the ganglion-cells. He defines general paralysis as an interstitial diffuse encephalitis.

Paul Kronthal⁷⁵_{Nov. 15} tries to solve the much-discussed question, whether the degeneration of nerves in the progressive paralysis of the insane is dependent upon a primary degeneration of the vessels, by examining, from the same parts of the brain of paralytics, the capillaries for their condition and sections for degeneration of fibres. His results were, that in every spot where degeneration of capillaries was found degeneration of fibres could also be ascertained. Seven brains were examined, and it was found that the capillaries in the frontal convolutions were always degenerated. In the cerebellar cortex they were degenerated four times in 5 cases. In the occipital lobes the capillaries in 7 cases were healthy thrice, and those of the central convolutions, although only examined twice in either case, were found diseased. The cortex of the temporal lobe showed healthy capillaries once, diseased ones twice; that of the parietal lobe, diseased ones once and healthy ones twice. At the International Congress at Berlin, normal and diseased capillaries were shown by Mendel, in whose laboratory Kronthal's observations were made.

Klippel⁷_{Dec. 13, '99} gives the result of the histological examination of 7 cases of general paresis. They showed the following lesions:—

I. Lesions of the meninges. These do not always show intense inflammation. Often only congestion and œdema can be found, even in places where their tearing-off brings away some cerebral substance. Sclerosis is more or less marked.

II. Cortical lesions: 1. A cortical erosion shows, in that part adherent to the meninges, more or less intense inflammation. 2. The borders of the erosion have vessels exsanguine and uninflamed. Fatty degeneration of elements and vessels is never seen, as in softening from embolism. 3. Perivascular inflammation is found in the cortex subjacent to the erosion. In the tissue at the level of an erosion are found: (*a*) Degenerative changes in the nerve-cells leading to a more or less complete disappearance. In every case there was also an increase in the number of small round-cells,

which sometimes penetrated into the protoplasms of the ganglion-cells, apparently leading to the destruction of the latter. (*b*) By a new method the nerve-fibres were found changed, and often had completely disappeared, especially under the large pyramidal cells. (*c*) The more the nervous elements were degenerated, the more the neuroglia gained in extent and clearness. According to the author's observations the disease is more like a degenerative parenchymatous inflammation than an interstitial encephalitis. (*d*) The vessels show either intense hyperæmia or complete ischæmia due to a thrombosis.

III. Lesions of the white matter. The cells of the neuroglia are denser and larger than normally, and infiltrated with granules. The degeneration of the nerve-fibres has the same characters as in the cortex, though less pronounced. The vessels, also, are generally less diseased than in the cortex.

IV. Lesions of spinal cord, nerves, and muscles. In the spinal cord and medulla we meet with diffuse degenerative lesions very similar to those in the brain. The ganglion-cells of the medulla and the anterior cornua of the cord were either destroyed or on the way to destructive degeneration. The nerves and muscles showed atrophic changes.

V. Lesions of other organs. The kidneys were always changed, often showing to the naked eye the lesions of an interstitial nephritis or of fatty degeneration. When the eye could not discover any gross lesion the microscope revealed degenerative changes in the epithelium, especially coagulation necrosis. The heart was always yellow and flabby; twice it was notably sclerosed.

Ludwig Meyer⁷⁵_{Oct. 15} concurs with Mendel in his views concerning the pathological anatomy of general paresis, and claims to have made practically the same observations in an article published as early as 1858.

A. Pick, of Prague,⁷⁵_{Nov. 15} examined the brain of a paralytic which had been hardened in alcohol and stained after the method of Nissl, and found, in different places of the cerebral cortex, peculiar comma-like formations almost exclusively in the direction of the longitudinal axes of the ganglion-cells and arranged radially to the cerebral surface. He concludes, after careful investigation, that the formations are circumscribed swellings of the axis-cylinders, which, after our modern views, must be called sclerosis. A comparison of these

findings with those of Mierzejewski⁴¹⁰_{p.41,75} in the white matter of the frontal and occipital lobes seems to leave no doubt that the appearances in Mierzejewski's cases were also due to the same process of sclerosis, although Mendel¹¹⁶²_{p.70} questions the admissibility of those findings.

Köberlin⁸³₈₉ found, in 23 cases of general paralysis, (1) secondary degeneration of the pyramidal tracts in 2 cases; (2) secondary degeneration of the posterior columns in 6 cases; (3) degeneration of pyramidal tracts and posterior columns in 4 cases; (4) hydro-myelus in 1 case. There was, therefore, a spinal lesion in 56.5 per cent. of the cases. There was confessed syphilis in 6 cases, probable syphilis in 4 cases. Of the following remaining 13 cases there were: 4 cases of sterility after several years of marriage; 3 cases with excess in *venere*; 1 woman who had 2 children, of which the one was still-born and the other died shortly after birth from general weakness. In the 6 cases of confessed syphilis the spinal cord was involved four times.

H. Lissauer⁶⁹_{June 26} gives the results of his observations of the changes of the optic thalamus in general paresis. These are not regularly found, but when found the author does not consider them accidental. The law of these changes is not quite clear as yet, but it seems that they certainly may be expected whenever well-pronounced focal symptoms of a sensory kind accompany the attack, and when these symptoms either remained stationary or repeated themselves in subsequent attacks. The changes in the optic thalamus bear the character of a secondary degeneration and presuppose focal lesions in the cerebral cortex. According to the extent and locality of the cortical lesions, there is also a change in the volume and, probably, also of the situation of the degeneration in the optic thalamus.

Bantakoff⁶⁸⁵_{June} presents a description of Golgi's method applied to the study of paresis. Inject as soon as possible after death, by the carotids, a solution of potassium bichromate with gelatin (100 grammes—3¼ ounces—of a 2½-per-cent. solution of the first with 5 grammes—77 grains—of gelatin). Cut the shrunken brain into little cubes of 1 or ½ centimetre, and plunge them into a 2½-per-cent. solution of bichromate. Change the solution every two or three days, concentrating it up to 5 per cent. Now change the 5-per-cent. solution for fifteen to twenty days in summer and up to

fifteen days in winter every day, and the brain is ready for a microscopic examination. Plunge the hardened pieces into a 75-per-cent. solution of nitrate of silver, wash them several times in the same solution, and make sections. After refuting some objections to the method raised by Rossbach and Scherwold and showing the advantages it possessed, the author reviews the study of the lesions of general paresis and states that the star-shaped cells of Golgi are equal in number and size in a normal brain, while in paresis they enlarge and produce many prolongations surrounding the vessels. The spider-cells, considered so characteristic by many authors, are derived from these cells. All these cells he considers to be derived from the leucocytes of the blood-vessels, supporting his view by the authority of Ranvier and Rouget, who have shown that the fibres of the connective tissue draw their origin from the protoplasm of the cells; he also advocates the theory of Virchow, Ziegler, Tillmann, and others, who have actually seen that the fibres of cicatricial tissue are only a differentiation of leucocytes. The large spider-cells have a double function,—to form the proliferating connective tissue and to give origin to the new capillaries. This connective tissue organizes itself, and by its retraction destroys the nervous elements.

Schütz (Leipzig)⁷⁵_{Oct 15} states that, in connection with his researches on the fibrous degeneration in the central gray substance (Höhlengrau) in progressive paralysis, he also investigated the anterior corpora quadrigemina, which are connected with it by fibres. In the majority of his paralytics he found, in the superficial gray matter of the anterior corpora quadrigemina, a more or less marked, but always perceptible, degeneration of fibres. The other layers of these bodies, as a rule, were also poorer in fibres, but the degeneration in the superficial gray matter was always most marked. However, he could not establish distinct relations between these findings and the clinical picture of the paralysis, especially with regard to the reflex rigidity of the pupil. The degeneration of fibres in the anterior corpora quadrigemina in progressive paralysis is only a partial phenomenon of a degeneration of fibres, which shows itself here and there through the whole central nervous system, and which attacks certain fibres characterized anatomically by their fine calibre and embryologically by the fact that they do not receive their medullary sheaths before the fifth week. Such

fibres are, *e.g.*, the tangential fibres of the cerebral hemispheres and the greater part of the fibres in the central gray substance. According to the intensity of the disease in different systems of these fibres is the clinical picture a different one in different cases.

The Warnings of General Paralysis of the Insane.—Geo. H. Savage,²_{Apr.5} in a paper before the Harveian Society, presented some thoughtful remarks upon the warnings of general paralysis. He said he spoke of it as one disease, though the symptoms may be manifold. He is more and more inclined to look upon it as a degeneration, a premature decay, and as frequently having a local origin. Using the simile of the pear, which may remain long ripe and sound, until a bruise or superficial injury is received, when it rapidly decays; so he thinks the overwrought brain may need the local injury of a blow, or a local change in nutrition, due to syphilis or some vascular change, to set up the degenerative process. Savage points out the extreme difficulty of distinguishing between cause and effect in the earliest stages of general paralysis. Drink, extravagance, restlessness, and sexual excess, alone or combined, may start the degenerative process; at the same time, one and all of these may be the early signs of the process which has already commenced, and which has enfeebled the higher powers of self-control.

Savage distinguishes two forms of onset of the disease,—the gradual and the sudden. In the latter there is nothing to warn before the storm has broken. In the gradual onset there is a more or less regularly progressive degradation of mind and body, so that the highest faculties show the first signs of change and the special attainments fail before the more general; the finer social and the finer muscular adaptations fail, and changes and weaknesses in mind and body show themselves.

“To start with the motor side, in many cases one meets with an account of early fatigue, so that a man who could walk 20 miles with ease finds himself done up at the end of 5; or a lawn-tennis player complains of his want of condition at the end of the first set. I believe that this fatigue is a really important symptom, and is associated with indecision, doubt, a tendency to look on the dark side of things, and even hypochondriacal weakness. In such cases a patient will be emotional, and complain that he feels he is getting very old. This feeling of fatigue may precede

the common symptoms of general paralysis by a year or more, and may be replaced for a time by a morbid buoyancy. This symptom is only really valuable when found associated with predisposing conditions in which general paralysis is common, and when one or more physical symptoms, such as inequality of pupils or loss of power of expression by speech or writing, can be detected.

“This feeling of fatigue may be related to muscular tremor or to muscular paresis, and, as I shall have to refer to the former under another head, I shall only here state that ataxic symptoms may precede general paralysis by an almost indefinite period.”

After referring to the association of ataxic symptoms with general paralysis, Savage says:—

“Probably one of the most striking, and by no means uncommon, warning symptoms of general paralysis is temporary aphasia. Bristowe has elsewhere discussed cases in which aphasia suddenly comes on and as suddenly passes off; the causes are not known, and have been variously explained. I must guard myself by saying that this temporary aphasia is not necessarily followed by general paralysis, but the cases to which I refer generally have a history that the patient has, without any real cause, or after slight excitement or fatigue, become aphasic. He may or may not have been faint at the same time,—rest or stimulants have soon restored him,—but in most cases it has been noticed that from that time there has been some speech defect; that the lips have been tremulous, or the expression faulty. It is common for these aphasic attacks to recur at very irregular intervals, and after several recurrences—it may be at intervals of a year or more—some other signs of disorder occur; but, in nearly all these cases, disorders of speech and writing are early and clearly evident. The centre affected earliest is the centre most deeply involved. I have known such aphasic attacks occur nine years before general paralysis was manifest, and in many cases they were two and three years in advance of any serious mental disorder. Aphasia is usually marked before change in the handwriting; but, in a few cases, there is great difficulty in writing, a dropping or isolation of letters, or fatigue in writing, long before general paralysis is suspected.

“Nearly related to aphasia is this change in handwriting, and I would specially call attention to the fact that some patients give

up writing, or alter their mode of holding the pen, for a year or more before signs of general paralysis are declared.

“Facial expression is very early affected, and it is a common experience to hear friends say that the patient had appeared to have developed a ‘fat face.’ The wiping out of the lines of the face gives the aspect of fatness, and, at the same time, the skin may become greasy, or there may be unilateral sweating.”

In reference to syphilitic affections and their significance as warnings, he says:—

“I will only emphasize my experience by saying that if, after a history of syphilitic cranial nerve-lesion, there are any signs of nervous instability, there is real reason to fear that general paralysis may be the result. Any local intra-cranial nerve-lesion, especially such as depends on syphilis, may originate general paralytic degeneration; and it may be well here to say that to this group belong many of the cases of traumatic general paralysis. I have met with instances in which a serious head injury has been followed by local paralysis, which has passed off only to be followed by a steady mental and physical degradation, which terminated as ordinary general paralysis. Whether surgeons will dare to interfere in these cases I cannot say, and I myself should strongly doubt the utility of surgical interference; for, though general paralysis follows in some cases of syphilitic lesions and injuries, yet I have not seen it follow ordinary brain-tumors.”

The change in mental and moral tone and character in these cases is thus referred to:—

“Changes of temper and character are probably the most constant of all the changes which are noticed in early general paralysis, the quiet man becoming noisy and the saving one extravagant; on the other hand, the extravagant man may become penurious and the gentle man passionate. In health we give evidence of our education, and in general paralysis we witness to our organic nature. Change in character, instability of purpose, occurring with some motor weakness, almost always point to general paralysis if met with in a middle-aged man. Self-feeling may be exaggerated and hypochondriasis may be one of the warnings of general paralysis. In such cases, as a rule, the morbid ideas are centred in the gastro-intestinal tract, and, in addition, there are physical signs, such as inequality of pupils or speech defect, to aid us.”

OCULAR SYMPTOMS IN THE THIRD STAGE OF PARESIS.

Charles A. Oliver,⁹_{Sept. 20} after an elaborate analysis of the symptoms, observed in general paretics, presents the following summary and conclusions: "1. The oculo-motor symptoms of the third stage of general paralysis of the insane, which consist in varying though marked degrees of loss and enfeeblement of iris-response to light-stimulus, accommodative effort and converging power, lessening of ciliary muscle-tone and action, weakening and inefficiency of extra-ocular muscle motion, all show parietic and paralytic disturbances connected with the oculo-motor apparatus itself, of greater amount and more consequence than those seen in the same apparatus during the second stage of the disease.

"2. The sensory changes of the third stage of general paralysis of the insane, which, though similar to those found in the second stage of the disorder, are so pronounced as to show a semi-atrophic condition of the optic-nerve head and marked reduction in the amount of both optic-nerve and retinal circulation, with consequent lowering of centric and excentric vision for both form and color, all indicate a degenerate condition of the sensory portion of the ocular apparatus, with impairment of sensory nerve action.

"3. The peculiar local changes seen in these cases, which consist in conditions of the choroid and retina indicative of local disturbance and irritation of these tunics, more pronounced than those seen during the second stage of the disease, all represent the results of greater wear and tear given to a more delicate and a more weakened organ.

"Both the motor symptoms and the sensory changes of the ocular apparatus, as thus described in the advanced or third stage of general paralysis of the insane, furnish not only evidences of a local disturbance of a more pronounced type than those shown in the second stage of the disorder, but plainly show themselves as one of the many peripheral expressions of fast-approaching degeneration and dissolution of the nerve-elements most probably connected with related cortex disintegration and death."

Trephining for General Paralysis.—Charles G. Wagner, Utica, N. Y.,²⁷⁸_{July} reports another case of trephining for general paralysis. His case is, we believe, the only American case on record. Wagner's operation was performed on March 16, 1890.

The patient was a negro, aged 32, who was admitted to the hospital July 23, 1889, with marked parietic symptoms. He became demented and untidy, and on March 14, 1890, had a convulsive seizure involving the left side and resulting in partial paralysis of this side, which gradually increased until, on the 16th, there was loss of motion and sensation in both arms and in the left leg, with partial coma and aphasia. As the right motor area seemed the one involved, two buttons of bone were removed, under strict antiseptic precautions, over the fissure of Rolando, about midway in its course. The dura was found distended, and was pushed into the opening by the fluid beneath. On incising the dura the fluid gushed forth, and about 6 ounces were removed. The convolutions presented an appearance of being flattened, and the pia was milky. The opening in the dura was closed by catgut sutures, as was also the scalp, except in the most dependent portion of the wound, where drainage was provided for.

The patient, on recovering from the ether, moved his paralyzed hands, followed the movements of persons in the room with his eyes, and spoke several words. He slept well the night after the operation, but on the following day no motion was observed in the left side, and he did not respond to questions, and would not or could not swallow food. At the end of three weeks he was able to walk about the room, and for three weeks longer he did well, was talkative, and able to help himself better than for months. He then began to fail rapidly, and in about a week he died. The autopsy showed no evidence of any recent inflammatory trouble. The opening in the dura had united, and the trephine opening was closed by a dense, strong, fibrous membrane. There was general pachymeningitis interna chronica hæmorrhagica, with considerable cerebral atrophy, which was more marked in the right hemisphere. The case was manifestly hopeless at the beginning, but it is, nevertheless, instructive and suggestive.

Ergotinine in General Paralysis.—Several authors refer to ergot and its preparations in the treatment of general paralysis, but Christian¹⁶⁴_{Dec. 19, '89} reports quite marked success in checking the convulsive seizures of this disease by hypodermatic injections of ergotinine. He employs $\frac{1}{60}$ grain (0.001 gramme) in solution, and has found one or two injections sufficient to check the convulsions.

MELANCHOLIA.

Several contributions have appeared during the year under this heading. Falvet,³⁶¹_{Jan.} after first enumerating the various states of mental depression which must be distinguished from melancholia,—for example, the form of depression sometimes associated with paresis, the melancholy stage of *folie circulaire*, or the delirium of persecution of Lasègue,—divides melancholia into three forms: 1. Conscious melancholia, a type in which hypochondriasis is an important factor. 2. Depressive melancholia, which is associated with stupor, frequently passing into maniacal excitement. 3. Anxious melancholia, with delusions of impending danger and persecution. The distinction between these and cases of delirium of persecution is that in these the basis of the ideas is fear, while in the cases described by Lasègue suspicion and distrust form the basis of the ideas.

George M. Robertson, of Edinburgh,¹⁶⁶_{Jan.} contributes an interesting and suggestive article upon melancholia from the physiological and evolutionary points of view. He finds that it is inconvenient to classify melancholia in accordance with degrees of intensity of depression as well as in relation to the degrees of disturbance of ideas, which are subtle and difficult to test. He reverts, therefore, to the motor changes, and subdivides melancholia into three groups: 1. Passive melancholia, in which there is absence of muscular tone. 2. Active melancholia, in which there is excitement and increased muscular tone. 3. Melancholia with stupor, in which the muscles do not respond to stimuli.

L. C. Gray¹⁶⁶_{Jan.} enumerates three diagnostic signs of melancholia. These "three constant symptoms" are melancholia, insomnia, and post-cervical ache. The first of the three seems to suggest that the diagnosis must be at least suggestively made out, in order to determine its presence; as to the second, it is a common antecedent to all forms of acute mental disease; and the third is far from as common as Gray appears to find it. We doubt not that these three—depression, insomnia, and post-cervical ache—may in some cases be suggestive, but without the first the other two are of little value.

MANIA.

Krafft-Ebing⁵⁷_{May 25; June 1, 8, 25, 29; July 13} has given a series of interesting clinical lectures upon this subject. He defines mania as a

psycho-neurosis characterized by well-marked discordance, exalted sensation of impressions,—an abnormal sequence of psychological phenomena. Krafft-Ebing's theory of the brain condition in mania is of hyperæmia. He says: "I think there can be little doubt that in mania we have a supernutrition with an overheating of the psychical machine."

He divides mania into two sections, designating them *mania mitis* and *mania gravis*, suggesting as synonyms maniacal exaltation and madness. He then proceeds to give a description of a case of *mania mitis*, drawing a detailed picture of life-like character. Proceeding to an account of *mania gravis*, of which he presents a graphic delineation, he follows the progressive bodily and mental changes.

He suggests opium or morphia in the acute stages, expressing great faith in its efficacy. The heart should be sustained by digitalis. In cases of hyperæmia, which seems to demand that the vessels be contracted, nothing, he says, is better than ergotin. In obtaining sleep and inducing bodily quiet, warm and prolonged baths are recommended. He also recommends hyoscine, having found it able to allay the most violent excitement of maniacal rage within ten minutes after its administration, and, if given in suitable doses, to produce a quiet, refreshing sleep of six or eight hours without intermission in most excited cases. He emphasizes, however, the apparent irreparable injury it does to the digestion and assimilating power of the body, which, above all things, must be vigilantly watched and fostered.

After an extended use of this drug we cannot fully indorse the author's objections. It does impair digestion to some extent, but we have never seen it seriously affect assimilation.

GENERAL PSYCHOSES.

Muscular Changes in Psychoses.—Fürstner, of Heidelberg, ³⁶⁸
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has made an elaborate examination of the alterations in the muscular apparatus in the simple psychoses. He first mentioned the alterations in the muscles met with in infectious and chronic disorders, which lead to extensive wasting and loss of power, and then spoke of the changes, first described by himself, but more fully studied by Buckholz, in the way of waxy degeneration in acute delirium and allied conditions. He then called attention to a dis-

order that might be looked upon as a simple functional psychosis, but which, through certain somatic complications, takes on the character of a grave disease, and which, therefore, may be designated "hypochondria gravis." In already weakened individuals (usually women), there sets in a hypochondriacal depression, with various sensations in the throat, abdomen, and bowels, analogous to the hallucinations of hypochondriacs, obstinate constipation, and usually loss of appetite. Later, the painful sensations become more intense and occupy all parts of the body; there is a feeling of weakness in the upper and lower extremities and inability to stand or walk. Increased patellar reflex, notably heightened muscular irritability to mechanical stimuli, with later-appearing muscular tension and tendency to contractures from the more marked symptoms. Fürstner considers the prognosis as unfavorable; all his observed cases succumbed to pulmonary affections. In one case he found, during the patient's life, alterations in the muscles, granular condition of muscle-substance, and muscle proliferation. Post-mortem, there was found advanced atrophy of the adductors, recti, biceps, pectoralis, and thumb musculature, together with marked increase of nuclei and central vacuoles. Since fever or other somatic symptoms were wanting in the clinical history, the explanation of these conditions must be looked for in the psychosis and the impaired nutrition. But this last is by no means always attended by alterations in the muscles; nor do they necessarily accompany the clinical syndrome. Fürstner holds it as possible that the obstinate constipation may be connected with the changes in the recti and intestinal muscles, and that the frequent lung complications may be explained through alterations in the muscular tissue of the diaphragm.

Next the author called attention to the changes in paralytics. He found, in cases of diseases of the lateral columns, advanced atrophy of the biceps, adductors, thumb-muscles, and psoas, together with unusually marked formation of vacuoles. First, nucleus-like formations appear in the muscles, which formed vacuoles, and these uniting destroyed the muscle-fibrillæ altogether. Besides the vacuoles and the atrophy, there was found marked central nuclear proliferation, also in the perimysium. These changes were not found in all cases.

Alterations of Body-Weight in Psychoses.—Fürstner ¹¹³_{No. 43} makes

three groups of those having psychoses, exhibiting variations of body-weight: 1. Those who have had vigorous normal brains previous to the development of the psychoses. 2. Those strongly predisposed by heredity, or suffering a relapse. 3. Individuals suffering from "organic" psychoses. In a series of cases in the first group there occurs a regular, abrupt fall in the weight-curve at the beginning of the psychosis, followed at a certain time by an equally regular rise, which often continues even after recovery. The absence of this condition on the disappearance of the psychic disturbance raises a doubt as to the reliability and permanency of the recovery. In another series of cases the fall is less regular and abrupt, and the succeeding rise is preceded by variations in the curve. These two curves are chiefly observed in primary acute psychoses, and constitute a favorable prognostic sign.

In cases of the second group there is a short fall, then a continuing variation, and finally, in favorable cases, a rise; in chronic forms the curve remains at middle height. In progressive paralysis and other organic psychoses there is often, after a short fall, a gradual, continual rise; then, from a certain time, a regular fall, in spite of good sleep, abundant nourishment, and but little exertion of the muscles. This loss of weight, which is often very rapid, can only be explained by the existence of cerebral changes.

Derangements of Standing and Walking Associated with Mental Conditions.—Binswanger ^{May 19, 26} discusses at length the conditions named "astasic" and "abasic" by P. Blocq, who in 1888 described 11 cases. The condition, Charcot says, principally occurs in young people, and is sudden in its onset and caused by an injury or strong emotion. After a long and elaborate survey and criticism of cases and theories, Binswanger sums up as follows: The new doctrine of "abasic" and "astasic" describes no new disease, but is embraced by known psychopathic processes. The psychopathological nature of the lesion once firmly established, a proper line of treatment can be adopted. The mental side—the paralysis of the active powers and the will—was in the last 2 cases treated successfully by opium, rest in bed, and hydropathic appliances. This serious factor removed, the methodic voluntary motions of the legs and body followed as a matter of course, the lesion lying, apparently, not in the locomotor apparatus, but in the powerlessness of some part of the brain to will to set it in motion.

Insanity and Bright's Disease.—Alice Bennett, ⁹⁸_{Oct.} in an article on "Insanity as a Symptom of Bright's Disease," says: "Briefly formulated, my experience has led me to believe: 1. That, contrary to the generally received opinion, affections of the kidney are very common among the insane. 2. That 'uræmic poisoning' is one of the most frequent causes of insanity. 3. That while the mental manifestations may be as varied as there are different centres subjected to irritation by these unknown poisons, the most prominent and constant symptom is some form of *mental pain*, which may range from simple depression, through all degrees and varieties of delusions of persecution, self-condemnation, and apprehension, with or without hallucinations, up to a condition characterized by a frenzy of fear, with extraordinary motor excitement and rapid physical prostration,—the 'grave delirium' or 'typhomania' of some authors. 4. That the motor centres are specially liable to affection, as evidenced by the restlessness and incessant activity of many cases, less frequently by convulsions and convulsive twitchings, occasionally by choreic movements, occasionally by cataleptoidal states."

We doubt very much whether Dr. Bennett finds many followers in her confession of faith. We venture the prediction that, of 1000 cases in ordinary life, as many cases of kidney disease will be found as in the same number of the insane, if general paretics are excluded. We have made it a subject of careful observation for some years, and have not found the proportion of kidney lesions which Dr. Bennett appears to have observed. In the few cases of "grave delirium" which have come under our care this point has been especially examined with negative results, and the same may be said in the majority of instances of mental depression and anxiety.

We recognize the merits of Dr. Bennett's contribution, not the least of which is the emphasis which she puts upon the fact, before an audience of general practitioners, that insanity is a symptom the explanation of which must be looked for in some disturbance of the general physiological functions.

Insanity Following Influenza.—Numerous cases have been recorded of insanity following the recent epidemics of influenza, and a few cases have been narrated of recovery apparently hastened by an attack of the epidemic. Metz⁷⁵_{Apr. 1} narrates a recovery from

paranoia. Febrile delirium, during an infectious disease, is, in fact, an acute attack of insanity. There are the febrile mental derangements proper to the fever (*psychoses fébriles*), and there is the delirium of convalescence (*psychosis asthéniques*). The latter embraces many distinct kinds. Toward the end of acute infectious diseases there is the "delirium of inanition," which may go on to the delirium of collapse, so well described by Weber.¹¹¹⁷₉₅ But, though asthenic delirium is the most common kind during convalescence (Christian³⁶⁰_{Sept., 73}), other kinds are met with, sensorial illusions being often present. There is, probably, in such cases, a cerebral intoxication due to microbic products of the virus which has set up the disease. One great distinction between the psychoses of convalescence and the delirium of fever lies in the evident influence of heredity, and the personal antecedents of the patient, upon the character of the delirium in the former case (Kræpelin, Savage), in contrast to its uniform course in the latter; in fact, heredity appears to play the chief part, and the acute disease is often only the accidental cause of the mental alienation. The diseases most frequently followed by the latter are: acute rheumatism, pneumonia, small-pox, intermittent fever, typhoid fever, cholera, and erysipelas; more rarely, angina and scarlet fever, and very rarely measles and whooping-cough. As to influenza, the psychoses which may follow it were scarcely ascertained before the last great pandemic. Pétrequin,⁵⁵_{No. 51, '37} who described the epidemic of 1837, only cites Rush, of Philadelphia, and Bonnet, of Bordeaux. The former says, "several persons who were affected by it had symptoms of madness, one of whom destroyed himself by jumping out of a window." Bonnet reports a case of furious mania after influenza during the epidemic. Crichton-Browne gives a case of acute dementia after the influenza of 1874.

Revilliod, of Geneva,¹⁹⁹_{Mar. 10} has studied the nervous forms of "la grippe," and has shown that delirium may be the first symptom, as in other acute diseases. Ewald, of Berlin, cites the case of a child, 7 years old, who went to school apparently well. When the class was dismissed, the child went off to a station and got into a carriage, saying that he was going to Leipzig. He was conducted home, but did not recognize the houses in the neighborhood, and remained in a state of violent delirium for some days. Meanwhile, influenza showed itself. The author's cases belong to the

period after influenza, when the fever has left. Some of Kræpelin's cases, and others, are also cited ⁶⁹_{Mar 13}: 1. *Melancholy and Hypochondriasis*. Insomnia is not uncommon. It is the first degree of mental trouble. The patient may be very disagreeable toward his doctor, who, if he takes the mind always into account, will regard this as an important symptom, instead of resenting it; 2 cases of profound depression, with delusions, are given by the author. Kræpelin gives a case of "hypochondriac melancholy with delirium," which should be separated from other forms of melancholy. It is characteristic of senile evolution of the brain, and is frequent in predisposed women at the menopause. Martin gives a case of suicide after influenza. 2. *Asthenic Psychoses*. Here there is a rapid enfeeblement of the mind, an acute exhaustion containing, according to Kræpelin, four groups of cases: (a) the delirium of collapse, already mentioned; (b) hallucinatory dementia, or delirium, or stupor; (c) asthenic dementia (the "cerebral torpor" of Ball); and (d) acute dementia or stupidity. All these forms, except the last, have been observed after influenza. Crichton-Browne¹¹⁶⁴₇₄ gives a case of true acute dementia after influenza, whether epidemic or not is not stated. Of asthenic delirium Pick gives a case. A girl, aged 20, was admitted into the asylum in Prague on January 8th. Five weeks previously she had been frightened by a conflagration, and by a savage dog that bit her. On January 4th had rigors, headache, and backache. During the night, gay delirium. Next day influenza showed itself, but the delirium, insomnia, and refusal of food persisted. There was complete confusion of ideas, and her humor was very changing. The face was pale, the expression gay; patellar reflexes normal; temperature normal; pulse small, 96. This condition lasted five days, after which she gradually recovered. Of the delirium of collapse Kræpelin gives 2 cases. Acute or hallucinatory dementia is characterized by a well-marked prodromal period, frequent remissions, the long duration of the illusions and hallucinations (*Anglicé* delusions and illusions respectively), and, lastly, the long course of the mental disturbance, the individuals being always hereditarily predisposed, and their cerebral nutrition profoundly affected. Mayser²⁹⁵_{'96} and Wille, of Basle,³⁶⁸_{'98} have carefully studied this form, of which Esquirol has given an excellent description—too much neglected in France, because Esquirol mixed up

other forms of insanity in the same chapter. It is wrong to consider dementia as always secondary: it may be the primary and only mental derangement. 3. *Other forms of mental disease.* Thus influenza, like other acute diseases, may be the last stroke in developing an attack of insanity, the kind of which is altogether independent of influenza. Even general paralysis has followed it, with the characteristic disturbances of speech, the loss of memory, the absurd hypochondriacal delirium, and the ideas of grandeur. A young epileptic, who had no fits for nine months, passed into a condition of somnambulism directly after influenza, and a case of typical mania is reported from Dorpat; also another by the author. Kräpelin gives 2 cases of typical delirium tremens after influenza, the author 1. Medico-legal questions have arisen out of the mental derangements of convalescence from acute diseases. Murders and other criminal acts have been committed, especially after intermittent fever. The following is an instance after influenza. On January 25, 1890, in the little town of Payerne (Switzerland), a young man, aged 22, killed his mother at one stroke in a sudden attack of madness. He had always been well-conducted, though somewhat taciturn. He was quite ignorant of the deed just committed, and could not comprehend why he was arrested. He had just passed through a bad attack of influenza, and had also just lost a young sister from the same disease. Influenza in itself never causes insanity, and in the above case the loss of his sister was the exciting cause acting on a system enfeebled by the recent disease. Lastly, *la nonna* is a grave, nervous form of mental *sequela* of influenza. Of four persons attacked by delirium and coma, three had had influenza recently, the fourth typhoid fever.²_{Mar. 29} This was the result of an official inquiry on the Italian border of Austria. Again, at Zozzo di Sorramontane, ten persons are said to have died of *la nonna* within a few hours!⁶_{Apr.} Pagello and Murer, who officially examined into this matter, found that they died of a sort of "exanthemous miliary contagious fever," a comprehensive term. They also declared that not one of the patients had died within a few hours; even the most rapid cases had lasted at least two days. The Vienna physicians consider *la nonna* (or *nonna*) as an asthenic psychosis, ending in lethargy and coma, occurring, for the most part, in persons overworked and exhausted in every way, who have not been able to attend to themselves

during the influenza. The Italian word *nonna*, literally *grand-mother*, may also be translated *old woman* or *sorceress*. Now, there is a well-known legend that when a sorceress touches a sick person with the end of the finger he will surely die. The power of auto-suggestion is now sufficiently known, and, in a superstitious country, such beliefs must occasionally have sad consequences, especially among convalescents from a depressing disease like influenza. The prognosis of all these psychoses is usually favorable, and the treatment is self-evident,—it should be “strengthening” in every sense of the term, and also soothing. Bartels and C. Becker⁷⁵_{Mar. 15} each contribute articles on this subject.

The Frequency of Infectious Maladies Among the Insane.—Gucci,⁶⁸_{No. 26, '89} comes to the conclusion, after laborious researches, that the insane succumb in but a small proportion to infectious diseases as compared with the general population. Of 15,248 deaths in Italian asylums 8.46 per cent. were due to tuberculosis, 4.16 per cent. to pneumonia, and 1.75 per cent. to typhoid fever. In 307,477 deaths in the general population, 12.22 per cent. were from tuberculosis, 15.50 per cent. from pneumonia, and 2.95 per cent. from typhoid fever.

It is a question which has an important bearing on this subject, as to how much this apparent immunity among the insane is due to their well-regulated lives in asylums, the improved hygienic surroundings as compared with their ordinary dwellings, and their comparative isolation from infection. When one compares the dwelling of the Italian of the middle or lower order with surroundings afforded by most asylums, the difference in death-rate from infectious diseases above pointed out does not appear so surprising.

Insanity with Multiple Neuritis.—Korsakoff, of Moscow,²⁹⁵_{p. 26, 76, 4} has described a form of insanity combined with multiple neuritis to which he gives the title “Psychosis Polyneuritica sur Cerebropathia psychica toxemica.”

Ireland,¹⁶⁶_{July} in commenting on this, says: “It is the result of blood-poisoning, which affects the whole nervous system, especially the peripheral nerves. It falls more frequently under the observation of general practitioners than those engaged in the treatment of the insane. The blood-poisoning which thus acts upon the nerves may be owing to the puerperal state, to typhus, tuberculosis, diabetes, jaundice, or to the toxic effect of arsenic, lead, carbonic

oxide, or ergot. I have myself seen similar symptoms follow malarial fever. It has been frequently described as a variety of insanity from abuse of alcohol; but Korsakoff has seen as many as 14 cases in which there had been no abuse of alcohol. The existence of neuritis along with insanity, to Korsakoff's mind, is evidently the essential characteristic of the disease. In one patient, who died at the Psychiatric Clinique at Moscow, he found a degenerative neuritis in almost all the nerves. In some nerve-bundles the alteration had quite the character of the segmental periaxile neuritis described by Gombault. The patient complains of weariness; the gait becomes uncertain; he has pains in the arms and legs; the muscles waste away; now and then it comes to something like paralysis and contractures; the electrical contractility diminishes; the patellar reflex is much less lively. Sometimes there is great irritability of temper with confusion of ideas; more rarely there is apathy. Often the patient cannot sleep at night, is fearful, wishes some one to sit by his bed. The memory is much affected, the patient forgets recent occurrences, while what took place long ago is better remembered. Sometimes the memory gets so bad that the patient during one interview repeats the same question, or tells over the same story, or forgets what happened to him the same day. There is also incoherence of ideas, sometimes with illusions of sight and hearing. Sometimes the irascibility rises to maniacal delirium; at other times the patient will sing songs the whole night long or murmur words in a low tone. The symptoms are seldom stationary; the mental condition gets better or worse with the general health. The prognosis is so far good that recovery generally happens in the course of time, sometimes in a few months, oftener after several years.

Korsakoff³⁶⁸_{B.21,H.3} describes 6 new cases of this form of insanity. Two of the patients had spasmodic movements in the feet and hands, resembling athetosis. Three of the cases ended in death, but there were no post-mortem examinations obtained.

HYPNOTICS.

Sleeplessness and its treatment continues to be a topic of marked interest, and during the year several important contributions have been made to the subject. Perhaps the most notable of these have been the papers of Krafft-Ebing,⁸ Jan. 9, 16 Germain

Séc,³¹_{Feb. 27; Mar. 6} and Chas. F. Folsom,⁹⁹_{July 3} Krafft-Ebing views the subject from a clinical stand-point, and does not permit himself to be bound down to any one or two hypnotics; nor does he encourage the administration of any drug simply because it has hypnotic powers. He speaks well of hyoscine, as will be observed in an article on mania by the same author, and also of paraldehyde, and especially of methylal, which he regards of especial value in delirium tremens.

Germain Séc, well known as a clinician, contributes an elaborate article upon sleep, insomnia, and sleep-producers. He divides the insomnias into nine classes, based upon the cause: (1) the sleepless from pain; (2) from digestive disorders; (3) from cardiac or respiratory troubles; (4) from cerebro-spinal or neurotic diseases, comprising lesions of the brain, general paralysis, acute and chronic anæmia, hysteria, and hypochondria; (5) from purely psychical disturbances; (6) from cerebral or physical fatigue; (7) from genito-urinary disorders; (8) from febrile conditions; (9) from coffee, tea, or alcohol intoxication. He presents a wide variety of therapeutic applications for these varied forms of insomnia, but the reader will at once observe that the drugs are directed to the cause, and not the condition, in nearly every instance.

The article by Folsom is an exhaustive study of insomnia and its treatment, with an analysis of the present state of professional opinion concerning the new hypnotics. He says: "The chief indications in insomnia are: to give hypnotic drugs rarely, and only in cases when other measures have failed; to use, as far as it is possible, the small dose, repeating as needed, so as to avoid the overaction or the cumulative effect of large doses; to be satisfied with the least amount of sleep that is safe, if produced by medicine; to avoid drugs, as a rule, except for euthanasia, when the mental condition is not such that all the after-effects can be noted; to bear in mind the fact that hypnotics given to produce sleep may increase wakefulness; to be on guard for unpleasant or toxic results, when any drug is given in sufficient dose to produce prolonged and profound sleep; to give the large dose when it is indicated; not to expect the same action or tolerance of new medicines in sensitive private patients as in hospital practice."

These very wise statements cannot be too forcibly impressed upon the profession. The careless habit of prescribing a hypnotic drug by routine cannot be too strongly deprecated.

The following causes or conditions of insomnia are indicated by Folsom: "1. The perverse *habit* of sleeplessness, a result of years, perhaps generations, of misuse of body and brain. 2. Insomnia from external causes, through the various senses, excluding habit, heat, cold, pain, hunger, light, noise, etc. 3. Excessive intellectual or emotional activity, including strain, excitement (pleasurable or distressing), grief, fear, worry, anxiety, etc., if sufficiently intense or prolonged. 4. Reflex causes of insomnia, indigestion, gastric or intestinal, by far the most common; genito-urinary and pelvic disorders, etc. 5. Traumatic antecedents, a sudden fall or blow, for instance; psychical, as in violent mental shock; or both, such as occur in railroad accidents, etc. 6. The auto-toxic sources of insomnia in acute diseases need only bear mention; in chronic disease, gout, lithæmia, rheumatism, tuberculosis, syphilis, malaria, leukaemia, and chronic nephritis, there is a similar cause, independent of any cerebral exhaustion or impaired nutrition which may be produced by them. The habitual excessive use of tea, coffee, tobacco, alcohol, morphia, chloral hydrate, bromides, cocaine, or other drugs, is a fruitful toxic source of insomnia. Chronic poisoning from arsenic and from lead, perhaps often by leading to vasomotor disorders, degenerative disease, and arterio-sclerosis, without the usual symptoms, must not be overlooked. 7. Exhaustion from wasting diseases and enfeebling conditions, pulmonary consumption, anæmia, starving, profuse and repeated hæmorrhages, sexual excesses, impaired nutrition of the brain from either deteriorated quality or diminished quantity of its blood-supply. 8. Of vascular origin, from hepatic disease, producing venous stasis; from cardiac and renal diseases with increased vascular tension; from asthma and hypertrophied or dilated heart, producing cerebral hyperæmia, anæmia or venous engorgement; from arterio-sclerosis, especially that of old age; exaggerated or insufficient blood-supply to the brain; venous stasis. 9. Meynert¹¹⁶⁵ repeats a statement previously made by him, that the nutrition and the *Erregbarkeitsverhältnisse* of the brain depend upon its relative weight, as compared with the weight of the heart. The blood-pressure, however, is naturally not governed solely by the heart and cardiac innervation, but by the resistance which the cerebral capillary vessels offer by virtue of their vasoconstrictor nerves, thus bringing in the higher automatic vasomotor centres of the cortex,

which are subject also to psychical influences, and the reflex vasomotor centres in the pons and medulla as well as the association-tracts, the reflex vasomotor centres of the spinal cord acting only co-ordinately or subordinately. 10. The neurasthenic condition, in exalting the direct and reflex excitability of the nervous system, naturally intensifies the usual causes and conditions of insomnia, the unusual sources of insomnia in neurasthenia, in my experience, being astigmatism and hallucinations of sight or hearing. The eye-strain from astigmatism is often in health unnoticed, when in states of debility it produces headache, dizziness, spasmodic muscular action or wakefulness. 11. The neuropathic temperament, usually by inherited predisposition, but which may be acquired. In its pronounced form it is closely allied to the well-marked functional diseases of the nervous system, and, at the critical periods of life, may readily develop into them. It is congenital, or due to early interference with the normal development of the brain, to faulty training, and to bad habits of living. It shows itself in infancy and childhood by irregular or disturbed sleep, irritability, apprehensions, strange ideas, great sensitiveness to external impressions, disagreeable dreams and visions, romancing, intense feeling, periodic headache, muscular twitchings. 12. Wakefulness is one of the most difficult symptoms to treat in the various stages of many forms of mental disease, and it is doubtless only an early symptom in many cases where it had been regarded as a cause. In hysteria, hypochondria, and organic diseases of the spinal cord and brain, including hæmorrhage, embolism and thrombosis, insomnia often taxes our utmost resources. 13. As a form of insanity—that is, as an interchangeable psycho-neurosis in families predisposed to mental disease—insomnia is not very uncommon, especially among Morel's *dégénérés*. In such case it is persistent for months or years, is attended with great mental and physical exhaustion from slight effort, and is most intractable to treatment. It usually ends in more or less permanent mental enfeeblement, with impaired will-power and diminished self-control; perhaps without, but generally with, other psychical symptoms."

DISEASES OF THE BLOOD AND SPLEEN.

By FREDERICK P. HENRY, M.D.,

PHILADELPHIA.

GENERAL CONDITIONS.

THE importance of the bacteriological study of blood is only equaled by the difficulty which attends it. Products of corpuscular disintegration may, as was shown by Kollmann⁵⁹ at the Tenth International Medical Congress, simulate cocci, diplococci, streptococci, bacilli, etc., so closely as to be distinguished from them solely by their behavior toward staining substances and the negative results of culture experiments. There can be no doubt that these morphological properties of blood have been the cause of many notorious blunders, and therefore the first requisite to its proper examination is that it be obtained under the strictest



SCHEURLEN'S PIPETTE.
(*Centralblatt für Bacteriologie.*)

antiseptic precautions. A simple method of accomplishing this object is suggested by Scheurle.⁵⁰ A glass tube, about 7 millimetres in diameter, is drawn out at one end and fused into a sharp point. (See cut.) Near the other end it is contracted into a neck, above which is stuffed some sterilized cotton. The instrument is then sterilized by dry heat. When needed for use it is taken from the oven, and the point, having been removed with red-hot scissors, is introduced into a superficial vein by a sort of boring movement. The skin over the vein is, of course, disinfected before the operation, and the point of the instrument directed against the current of blood. As suitable veins for the operation, Scheurle recommends those of the back of the hand, the median vein of the forearm, or a branch of the cephalic. When the procedure is successful the tube immediately fills with blood, which may be

examined on the spot, or the point of the instrument may be again occluded by fusing and its contents examined later. In the latter event, the blood will have to be inspected after coagulation has taken place. In health the blood is free from microbes, although it may contain certain substances, such as peptones, which are generally regarded as products of the activity of micro-parasites. In states of inanition, as well as just before death in various diseases, the blood may contain microbes, the presence of which is believed by de Renzi³_{Oct.29} to be due to an enfeeblement of the function of phagocytosis.

Maragliano³_{Oct.29} discusses the interesting question whether there is, in the strict sense of the word, such a thing as disease of the blood, *i.e.*, an affection originating in the corpuscles or serum independent of disease of the hæmatopoietic or other organs, and decides it in the affirmative. Since the corpuscles, while circulating in the vessels, are physiologically independent of the blood-making organs, why, inquires Maragliano, should we deny to them pathological independence? There can be no doubt that disease may originate in the blood, and it is probable, as Maragliano believes, that the health and life of the corpuscles are largely dependent upon the constitution of the serum; but it must be borne in mind that the life of the blood constituents is evanescent, and that although a given corpuscle may leave its birthplace in a healthy condition, its successors may enter the circulation bearing with them the seeds of inherited disease. Probably the best example of an independent disease of the blood is afforded by the malarial fevers, which all agree are caused by a hæmatozoon.

Sciolla³_{Oct.29} has examined the blood with reference to its physico-chemical properties in a number of diseases, the most interesting of his results being that the density of the blood, as a whole, is diminished during fever, to rise again during convalescence. The same is true of the specific gravity of the serum, with the difference that it begins to rise with the first signs of improvement, sometimes even before these are otherwise manifest. H. v. Hösslin³¹_{Sept.23,30} has studied the effect of insufficient nourishment upon the composition of the blood, and concludes that, while it co-operates with other causes of anæmia, it has, *per se*, no influence in determining that condition. In badly-nourished individuals the whole mass of the blood is diminished, while the relative

proportions of its constituents are not materially altered. The same is true of the muscles and other organs. The pallor which is so common in badly-nourished individuals is believed by v. Hösslin to be due to an ischæmia of the surface-vessels, caused by the fact that in such persons the heat production is much below the normal. The activity of the circulation of the skin is in direct ratio to the production of heat, and if the latter is permanently deficient the skin is habitually anæmic. The reader may recall the interesting observations of Oppenheimer, referred to in the ANNUAL of last year, to the effect that pallor of the surface is not necessarily indicative of anæmia. I have myself often been struck with the absence of any demonstrable alteration of the blood in pallid, anæmic-looking persons, and have long been aware of the fact that the facies is a most unreliable guide, so far as anæmia is concerned.

Arthur Klein⁸⁴_{Nos 36 to 40} discusses in detail the modern methods of examining blood and the practical results which they have accomplished. The article, while it adds nothing material to our knowledge, contains an excellent *résumé* of the subject, and will well repay an attentive perusal. A novel method of examining blood is proposed by Carl Laker.¹¹³_{Aug. 31} The researches of Rollett have taught us that the passage of electric currents through blood causes it to become "lake-colored," a result due to the separation of the hæmoglobin from the corpuscles. Laker has found that the specific resistance of the blood-corpuscles to the electric current, or, in other words, that the amount of electricity necessary to extract their hæmoglobin, varies within wide limits, and believes this test to be much more delicate than any of the ordinary methods of examination. Further facts are needed to establish this claim.

A micrometric study of 4000 red blood-corpuscles, in health and disease, by Marshall D. Ewell,⁷⁷⁹_{Apr.} has led to a number of interesting results, of which the following are of the greatest practical interest: 1. In the use of the micrometric test, no confidence can be placed in the result unless the errors of the micrometer used, with reference to some authentic standard, are known. 2. There is no advantage in using very high powers in such investigations. 3. It is impossible, in the present state of science, to say of a given specimen of blood, fresh or dry, more than

that it is the blood of a mammal. A study of old blood-stains has convinced Ubaldo Mussi⁵⁸⁹_{Aug.23} that the characteristic chemical and spectroscopic reactions may be obtained from a stain twenty years old.

An excellent article concerning the rules and the application of Reichert's hæmometer is contributed by Frederick Gaertner, of Pittsburgh,²⁶⁰_{Apr.} and should be carefully studied by all who use this well-known instrument. It seems to me, however, that the apparatus is more generally known by the name of its inventor, von Fleischl, than by that of its patentee, Carl Reichert.

Ohlmacher⁷⁷⁹_{May} publishes an interesting *résumé* of the physiology and pathology of the blood-plaque, but does not refer to the work of Löwit, whose claim that the so-called third corpuscular element of the blood is a product of retrograde metamorphosis demands careful investigation. Reference was made to Löwit's careful experimental work in the ANNUAL of last year. The effect of heat on the red corpuscles is described and figured by Talamon³¹_{Mar.6} in an article which is well timed, in view of the present general employment of heat in microscopical technique. Intra-globular hyaline bodies and flagella possessed of undulatory movements are among the results of the application of this agent, and might readily be mistaken by the inexperienced for pathological changes. Among comparatively recent histological discoveries is the complicated structure of nuclei. A cell-nucleus, once believed to be composed solely of a membrane inclosing a homogeneous substance having a strong affinity for certain stains, and one or more nuclei, is now known to be made up of one or more filaments folded in such a manner as to form a complicated network, in the meshes of which are imbedded the nucleoli.

Mayet, of Lyons,²¹¹_{May 11} has taken advantage of the opportunity afforded by a case of leucocythæmia to study the nuclear structure of leucocytes, and recommends the following technique: The blood to be studied is mingled on the slide with three or four times its volume of crystallizable glacial acetic acid, the effect of which is to dissolve the protoplasm of the cell and isolate completely the nuclei. By this means the latter are sharply defined and become comparatively easy objects of microscopic study. With reference to the prevailing shapes assumed by the nuclei, Mayet has divided the latter into seventeen varieties.

Massart and Bardet²⁷⁶_{Mar.20} have made a series of interesting and suggestive experiments on the irritability of the leucocytes and the importance of this property in nutrition and inflammation. The most interesting part of their work is that which demonstrates the reaction of the leucocytes toward chemical substances and especially toward the products of bacterial growth. A number of glass capillary tubes were formed into a bundle by fusing them together at one end, and, after being completely filled with a bacterial culture, were introduced into the peritoneal cavity of a frog. At the end of twenty-four hours they were removed and found filled with leucocytes. Control experiments in which the tubes contained the culture fluid alone yielded negative results. An attraction between leucocytes and products of bacterial activity is thus beautifully demonstrated, and the various applications of this fact to the process of inflammation is of great interest. For example, the bacillus of diphtheria, when deposited on the mucous membrane, secretes toxic substances which attract swarms of leucocytes, whose function it is to devour the micro-organism and its products. The staphylococcus pyogenes albus was found to attract the leucocytes in greatest quantity.

R. Stierlin⁵⁴_{Feb.16} has examined the blood of a number of children with special reference to the effect of iron, arsenic, codliver-oil, and a holiday in the country. He found, in common with other observers, that, in light grades of anæmia, iron increases the number of the red corpuscles. Arsenic, on the other hand, was invariably found by Stierlin to diminish the number of the red corpuscles of children. Of 36 children who spent three weeks in the country, Stierlin found in two-thirds a decided increase in the number of the red corpuscles, while in the remaining third there was a decrease in the number of these elements. The latter fact was believed to be due to indigestion, struma, and incipient phthisis,—affections little influenced by so short a stay in the country.

D'Arsonval³_{Feb.5} has photographed the spectra of oxygenated blood and has thereby demonstrated an absorption band in the ultra-violet region, which he claims to be perfectly characteristic. For the purpose of this demonstration photography is much superior to direct vision, showing the band in a solution of 1 to 10,000.

CHLOROSIS.

One of the best recent studies of chlorosis is by Charles N. Dowd, of New York, ⁵_{June} and is based on a careful hæmoscopic study of 31 cases. Dowd has evidently approached his subject without preconceived opinions derived from authoritative statements, and, therefore, his results have the value of independent observation. One of these results is that a "normal number of corpuscles is not characteristic of chlorosis,"—an opinion which I have always maintained. I have at present under my care a typical case of chlorosis in which the number of red corpuscles is 3,540,000 per cubic millimetre (*i.e.*, 70.8 per cent.), while the percentage of coloring matter is 25 per cent. Another fact recorded by Dowd is that the "poverty in hæmoglobin always exceeded that in red corpuscles." This, of course, is universally accepted. An interesting statement, and one which I can corroborate, is that in many cases a "moderate amount of chlorosis is an accompaniment of another condition where the successful treatment of the other condition is much easier when iron is administered for the chlorosis." Such cases are classed by Hayem under the head of chloro-anæmia. Dowd's paper will, doubtless, take a permanent place in the bibliography of chlorosis.

The subject of thrombosis in the course of chlorosis still attracts considerable attention. A clinical lecture is devoted to it by Rendu, ³_{Apr. 30} who believes that micro-organisms may have a part in its production. Proby ²¹²_{Feb} calls attention to the fact that the most frequent manifestation of chlorotic thrombosis (*phlegmasia dolens*) generally follows excessive fatigue, and suggests that waste-products of muscular action may enter the circulation, injure the vascular endothelium, and so give rise to thrombosis. Ozenne ²⁴_{Sept. 21} believes the two most important factors in the production of venous thrombosis to be (1) alterations of the blood, (2) alterations of the vascular endothelium. A fatal case of thrombosis of the cerebral sinuses, occurring in a chlorotic woman 24 years old, is reported by Paul Sollier. ¹⁵²_{June 16} The posterior halves of the superior and inferior longitudinal sinuses, as well as the occipital and lateral sinuses, were distended with coagula. There was besides a hæmorrhagic focus in the anterior portion of the internal capsule, between the caudate and lenticular nuclei. The only symptom complained of by the patient was continual pain in the occipital

region. In this case, as in so many others reported under the head of chlorosis, there was no examination of the blood.

Huchard²¹²_{July} draws a distinction between febrile chlorosis and fever occurring in the course of chlorosis. The former is very rare, indeed, and is often confounded with the fever due to latent pulmonary tuberculosis. Probably the best diagnostic criterion in such cases is the surface-temperature, which, as long ago pointed out by Peter, is elevated on the side of the affected lung. The temperature is very unstable in many chlorotics, in which respect they resemble convalescents from febrile affections. Every one has observed the rise of temperature in convalescents from typhoid fever induced by such trivial causes as the excitement of a visit from friends or relatives. In chlorotics also tachycardia and elevation of temperature may be caused by emotion, by muscular fatigue, and by slight menstrual derangements. Most of these attacks are really pseudo-febrile, as indicated by the fact that the urine continues abundant and light-colored. They only need rest for their treatment. Genuine febrile attacks may be due to an auto-intoxication from the intestinal canal, the treatment in such cases being obvious. Such attacks do not, however, constitute the febrile chlorosis described by Huchard. In the latter the temperature is continuously elevated and the anæmia is intense. The condition, in fact, is the same as that which prevails in pernicious anæmia, long since described as anæmic fever, and, in my opinion, it is impossible to draw a line of demarcation between them. Girode¹⁵²_{May 30} reports a case of malignant endocarditis in the course of chlorosis, the patient being a young woman aged 21. He gives an interesting description of the autopsy; but the diagnosis of chlorosis is based solely on the symptoms and anamnesis, no examination of the blood having been made.

The question of anæmic vascular and cardiac murmurs, which are often so well marked in chlorosis, is discussed by Neusser,⁸⁴_{Sept. 29, 27} who believes hydræmia to be largely concerned in their production. In support of his argument, he calls attention to the well-known fact that immediately after a copious hæmorrhage anæmic murmurs are not heard; whereas, later, when the volume of the blood has been restored by the absorption of water, *i.e.*, when the blood is markedly hydræmic, these murmurs become manifest. There is nothing novel in this doctrine. For several years I have taught

that inorganic murmurs are produced by blood of low specific gravity flowing through the vessels under high tension. It is generally supposed that the arterial tension in chlorosis, in which such murmurs are most often heard, is low; but this is not the case, as may be proved, not only by means of the sphygmograph, but by the facts that the heart is often found hypertrophied and its second sound accentuated.

II. v. Hösslin³⁴_{Apr. 8} has examined the fæces of a number of chlorotic women with reference to its percentage of iron and hæmatin, and has found these products increased to such an extent as only, in his opinion, to be explained by occult gastro-intestinal hæmorrhage. The dark, tarry discharges described as symptomatic of gastro-intestinal hæmorrhage are only observed after a copious loss of blood. According to v. Hösslin, a gastric hæmorrhage of 40 to 50 grammes ($1\frac{1}{3}$ to $1\frac{2}{3}$ ounces) gives rise to no characteristic appearance of the fæces, and, therefore, he argues that slight and frequent gastro-intestinal hæmorrhage may escape detection. This may be true, but it must be borne in mind that obstinate constipation is generally associated with chlorosis, and it scarcely seems probable that the profound alteration of the blood in well-marked cases of chlorosis can be accounted for by occult hæmorrhage. In accordance with his theory, v. Hösslin explains the efficacy of iron in chlorosis as, in part, due to its well-known hæmostatic action. He also refers the greenish-yellow hue of chlorotic girls to absorption of hæmoglobin and hæmatin from the intestinal canal. The theory is certainly maintained with great ingenuity, and the article is well worthy of a careful study on account of the thorough knowledge of the subject displayed by the author.

Treatment.—Marcus, of Pyrmont,⁴¹_{May 12} in the course of an elaborate article on the treatment of chlorosis, insists on the distinction between this affection and anæmia, and yet gives no data by which such distinction can be made. He also draws a sharp distinction, more theoretical, however, than clinical, between acute and chronic chlorosis. The acute forms are, he says, readily amenable to treatment,—in fact, tend to rapid recovery,—while the chronic forms persist in spite of the most varied therapeutic measures. Marcus is most outspoken in his opposition to cold bathing, whether in salt or fresh water, in cases of chlorosis, believing such measures to be not only useless but decidedly injurious, and even capable

of developing the affection in those predisposed to it. In his opinion mountain air is also injurious, in support of which statement he refers to 6 cases in which severe chlorosis immediately followed a stay of several weeks among the Alps. In the medicinal treatment of chlorosis, Marcus cannot dispense with iron, but finds no preparation so well borne and so effective as the natural chalybeate waters. He refers to cases which, after persisting for months in spite of the ingestion of enormous quantities of milk and the internal use of various tonics, were speedily cured by a course of treatment at Pyrmont. At the suggestion of Senator, he has used dilute hydrochloric acid in the treatment of the dyspepsia so common in chlorosis, and with excellent results. A very annoying symptom of chlorosis is falling out of the hair, for which Marcus has used, with good effect, a wash composed of alcohol containing 1 per cent. of dilute hydrochloric acid. He is not one of those who proscribe marriage to their chlorotic patients, but believes, with Hippocrates, that it is a benefit. He is able to refer to numerous healthy mothers whom he had treated for severe chlorosis in their girlhood. The most extraordinary treatment of chlorosis yet employed is that of Dyes, of Hanover, who has found a follower in Wilhelmi of Güstrow.¹⁶⁹
Feb. It consists of small venesections, 1 gramme (15 minims) of blood to the pound of body-weight. This was the amount recommended by Dyes, but Wilhelmi did not abstract more than half that quantity. He reports 30 cases treated with excellent results by this paradoxical method, but cannot yet speak of its influence on the occurrence of relapse, as too short a time has passed since he began to practice it. He advises that the blood be abstracted near the time of menstruation; two or three days before it in cases of habitually profuse discharge, and two days after when the flow is habitually scanty. The venesection should not be repeated until after an interval of four to eight weeks. Wilhelmi's views have excited considerable comment, but, as he himself says in the preface to his book,¹⁰¹⁹ "the time is past when the improbable is to be branded as the impossible, and when that which contradicts our traditional conceptions is to be decried as swindling."⁷⁶⁰
Apr.5

W. A. Hollis²
May 31 states that no drug in his experience (which is by no means a small one) "is so valuable for the treatment of idiopathic chloremia as carbonate of iron; and the powdered saccharate,

freshly prepared, gave the best results. It should be given after meals in drachm (4 grammes) doses, three or four times daily." Under this treatment Hollis has observed an increase of 20 per cent. in the amount of hæmoglobin in the course of a week, with corresponding amelioration of all the symptoms. "In addition to other advantages, the large doses of iron administered in most cases sufficiently regulated the bowels without the assistance of purgatives."

In the treatment of chlorosis Hayem¹⁰⁰_{Sept. 4} finds iron indispensable. Nothing, he says, can replace it. Of the numerous preparations of iron he prefers the protosalts, and of these the protoxalate. In addition, he pays strict attention to the diet and regimen of his patients, absolutely prohibiting alcoholic stimulants, as well as tea and coffee, in the beginning of treatment, and substituting for them milk and kephir. Besides the iron, he gives, habitually after each meal, a dose of dilute hydrochloric acid.

Duclos, of Tours,¹⁷_{Oct. 31} like Sir Andrew Clark, believes chlorosis to be due to faecal intoxication, and treats it successfully with purgatives and intestinal antiseptics. Doubtless a certain number of cases are complicated with this condition, but I agree with Hollis in the opinion that "auto-infection from retained faecal matter is not commonly productive of this blood disorder, else it would doubtless be far more prevalent than it is."

PERNICIOUS ANÆMIA.

W. Hunter²_{July 5, 12} has not altered his views concerning the hæmolytic nature of pernicious anæmia, and brings to their support additional facts derived from a careful study, both clinical and pathological, of a fatal case. The patient was a man aged 59, with the characteristic blood changes. Exacerbations of weakness coincided with a deepening of the persistent yellow hue of the skin, as well as with drowsiness, slight rise of temperature, flushing of face, and contraction of pupils, and were followed by dark-colored stools and the passage of very acid, high-colored urine, rich in pigments and containing renal cells and casts in which were imbedded granules of blood-pigment. A peculiarity of this high-colored urine, which Hunter has observed in other cases, was its low specific gravity, averaging 1014. The pigment described by Mac Munn under the name of pathological urobilin was present in large

amount. Hunter attaches a highly diagnostic significance to the presence of this pigment in the urine in cases of pernicious anæmia, differing therein from Mott,^{6 Feb. 8} who regards the quality of urinary pigment in such cases as of secondary importance compared with the large quantity of urobilin which is so often found. The urine in this case also contained an increased amount of iron, and Hunter believes this observation, together with that of the presence of renal cells containing blood-pigment, to be original. In the same case Hunter found in the urine two ptomaines,—cadaverine and putrescine,—which are never formed except by the action of micro-organisms. They are not the result of ordinary putrefactive changes, for in scarlet fever, diphtheria, typhoid fever, and other affections in which putrefactive processes in the intestines are in excess, they are absent from the urine. They have been found in no other condition but cystinuria,—3 cases, the first of which was studied by Udranzky and Baumann, the last 2 by Brieger. Hunter believes the presence of these ptomaines in his case to indicate the action of special micro-organisms in its causation. His report of this case, like all his published work, bears the imprint of the most conscientious investigation by one thoroughly versed in all the modern methods of pathological research.

F. W. Mott,^{6 Feb. 8} reports a fatal case of pernicious anæmia in a woman aged 49. A chemical examination of liver, spleen, and kidney was made by S. A. Vasey. The liver contained a large proportion of iron in the ferric state, while the spleen was free from iron in appreciable amount. Mott calls attention to the facts observed by C. J. Bond and Copeman that the addition of putrid serum to normal blood causes crystallization of the hæmoglobin, and that the blood of pernicious anæmia has a special tendency to form crystals. Bond has also demonstrated that arsenic arrests the tendency of the blood to form crystals when putrid serum is added to it, a fact which may tend to explain the efficacy of this drug in cases of pernicious anæmia. Like Hunter, Mott is inclined to refer the cause of pernicious anæmia to the agency of micro-organisms. His report concludes with these words: "The interesting observation that the addition of putrid serum causes normal blood to rapidly form hæmoglobin crystals suggests the probability that the disease is dependent upon the formation of some poison or ferment associated with micro-organisms."

A case illustrating the difficulty of drawing a line of demarcation between pernicious anæmia and chlorosis is reported by Luzet.¹⁵²
July 18 The case being in the hospital service of Hayem, was, it is unnecessary to say, thoroughly studied in all its bearings, and especially with reference to the alterations of the blood. The patient was a woman aged 23, who, four years before admission to the Saint Antoine Hospital, had been treated at the Pitié for chlorosis by Jaccoud. The symptoms of pernicious anæmia appeared shortly after her second confinement, and increased up to the time of admission, eleven months later, when she was so weak that she had to be carried to the hospital on a "stretcher." The red corpuscles numbered 781,200 at the first examination, while the value of each corpuscle was 1.091,—figures characteristic of pernicious anæmia. When discharged, about four months later, the corpuscles numbered 4,625,000, while the value of each corpuscle was 0.76. Luzet regards the case as primarily one of chlorosis, which, under the influence of debilitating causes, became converted into one of pernicious anæmia. This seems to me perfectly reasonable, and I have reported a precisely similar case.⁹
July 3, '86 In Luzet's case the urine was highly charged with urobilin (*fortement urobilique*) and of low specific gravity. The treatment consisted of hypodermic injections of Fowler's solution and large doses of protoxalate of iron.

Israel⁴
Mar. 10 reports a case which presented the clinical features of pernicious anæmia, but cannot be properly classed under that head, as it was complicated with swelling of the spleen and multiple tumors connected with the dura mater and the periosteum of the ribs, as well as with a marked increase of the leucocytes. It derives its chief interest from the fact that, in the discussion it elicited, Leyden made some remarks concerning the red corpuscles in pernicious anæmia. In pernicious anæmia there are, he says, nucleated red corpuscles of different size, divided by Ehrlich into large cells, megalocytes and gigantocytes. In the severest forms of secondary anæmia these nucleated cells are either entirely absent or very scarce. In Israel's case they were very numerous, as many as six or eight appearing in each microscopic field.

Rindfleisch³⁴
June 3 has made a careful study of the marrow in 2 cases of pernicious anæmia, and concludes that the affection is dependent upon defective hæmogenesis. He bases this opinion

upon the absence of elements which he and others regard as transition forms between the red nucleated marrow-cells, which were unusually abundant in his cases, and the ordinary red blood-corpuscle.

J. Kaufmann,⁴_{Mar. 10, 17} in his report of 2 cases of pernicious anæmia ending in recovery, gives an admirable historical review of the different theories concerning the pathogenesis of this disease. The student will find it replete with condensed information. Without discussing the question whether pernicious anæmia is a disease *sui generis*, or a process which may be the result of various causes, he pithily remarks that it is of the greatest importance for the practitioner to be aware of the fact that the characteristic symptom-complex of this affection may be due to removable causes. In his first case, a woman aged 27, the symptoms were chiefly those of chronic dyspepsia, with dilated stomach. The blood-corpuscles were much reduced in number and altered in shape. The figures of the first count are not given, but a later one gave 2,000,000 red corpuscles to the cubic millimetre. Five months after admission they numbered 5,500,000, and the patient was discharged cured. The treatment consisted in methodical lavage of the stomach and arsenite of soda internally. The results in the second case, a woman aged 35, were equally favorable and the case more pronounced, retinal hæmorrhages being present. The treatment was by arsenite of soda alone. It must be confessed that in neither of these cases was the anæmia extreme.

Paul Tissier¹⁰⁰_{July 19} gives an excellent *résumé* of the literature of pernicious anæmia, the part relating to the pathogenesis of the affection being naturally of greatest interest. He believes the disease to be due to a defect of sanguification, either primary or as the result of various anæmic states of diverse origin. Among the causes of the primary form are infection and auto-intoxication.

Hayem,³_{Feb. 26} calls attention to the fact that, while the red corpuscles of normal blood are immovable, these elements in high degrees of anæmia are endowed with four kinds of movement: 1. A movement of the entire mass of the corpuscle. 2. The projection of mobile prolongations. 3. A movement of oscillation, manifested solely by minute corpuscles. 4. A movement which results in changing the position of the corpuscles. Hayem regards these movable corpuscles as bodies arrested in their evolution and

still retaining the contractile properties of the "hæmatoblasts," from which he believes the red corpuscles to originate. On superficial examination they might readily be mistaken for parasites.

Browicz⁴¹_{May 12} has observed the phenomena described by Hayem in several cases, one of which was a case of pernicious anæmia, another one of suspected cancer of the liver. The corpuscular movements can be observed in blood at the ordinary temperatures under a power of 600. Browicz does not agree with Hayem in regarding the movements as vital, but considers them as a species of Brunonian movement due to altered adhesion relations (*veränderter Adhäsionsverhältnisse*) between the corpuscles and the plasma. The following facts support this conclusion: 1. In a blood preparation surrounded with vaseline, to prevent evaporation, the movements may be observed for days, *i.e.*, long after the leucocytes have ceased to manifest amœboid movements. 2. In blood exposed to sudden heat intense enough to destroy vitality the same movements may also be observed. Several years ago I observed distinct movements in the red corpuscles in a case of pernicious anæmia, but made no public mention of the interesting fact.

Neusser¹¹³_{Mar. 29} discusses the various anæmias with special reference to their differential diagnosis. In addition to the well-known features of the blood of pernicious anæmia, he mentions and lays stress upon the reduction of the white cells,—a fact already alluded to by Hayem and others. He offers two hypotheses in explanation of the so-called anæmic fever: (1) that the products of destruction of the red corpuscles may act in a pyrogenic manner on the heat-centres; (2) that the same products may destroy the leucocytes and hæmatoblasts, and so set free in the blood a quantity of fibrin-ferment. This "ferment-intoxication" would explain, by embolic and thrombotic processes, the frequent capillary hæmorrhages in the retina and elsewhere. He differs from Hayem, who regards the presence of nucleated red corpuscles in the blood of adults as of necessarily fatal omen. Neusser states that so long as the nucleated corpuscles do not exceed the size of a normal red globule, and especially if their nuclei are readily stained, the process is to be regarded as one of conservative blood degeneration.

McPhedran⁹_{Oct. 11} reports 5 cases of pernicious anæmia,—3 males and 2 females,—in all of which the symptoms, including high-

colored, acid urine of low specific gravity, were well marked. None of the cases was fatal; 3 recovered; in a fourth no improvement had taken place at the time of publication, and the fifth was still under treatment. The good results seemed due to small, frequently-repeated doses of arsenic, which were persevered in, notwithstanding the fact that they caused great discomfort in 2 of the cases. The first of McPhedran's cases, a physician aged 49, was in a desperate condition when treatment was begun, the red corpuscles being reduced to 745,000 per cubic millimetre. The series is the most interesting that has lately appeared.

D'Espine and Picot²_{Nov.1} report 2 cases of fatal anæmia in children aged 2 and 13 years. In the elder an autopsy was held, and nothing positive found except thickening and inflammatory infiltration of the coats of the lower portion of ileum, cæcum, and appendix vermiformis. There is no record of an examination of the blood, but the symptoms were those of pernicious anæmia. The reporters attributed the rarity of pernicious anæmia in childhood to the fact that the "hæmatopoietic activity, of the bone-marrow especially, is so much greater and more intense in infancy and early childhood than during adult age."

F. W. Mott¹⁵_{Aug.} has made a careful study of a typical case of pernicious anæmia in a boy aged 11. He died on the evening of the day on which he was seen by Mott, but not before the blood was examined and found to contain 800,000 red corpuscles per cubic millimetre (16 per cent.), while the color was 20 per cent. of the normal. Characteristic pigmentary changes indicating increased hæmolysis were found in liver and spleen. Mott discusses Hunter's theory that pernicious anæmia is due to the "absorption from the alimentary canal of some chemical product of the growth of micro-organisms," but does not consider it as proved. His experience, also, has not enabled him to determine "a constant relation between the pyrexia, the diminution of the corpuscles, and the color of the urine,"—points upon which so much stress is laid by Hunter. In concluding this interesting article, he suggests that the "pathology of pernicious anæmia so far resolves itself into this, that an excessive hæmolytic process of a progressive and remittent character occurs for no proven ascertainable reason, leading to an attempt on the part of the hæmopoietic tissues to repair this excessive waste, and often eventually determining a

reversion to the embryonic type of blood formation in the marrow and the spleen."

Treatment.—The treatment of anæmia was the subject of a paper by Laache, of Christiania, ⁸_{Sept. 18} at the Tenth International Medical Congress, which may be summarized as follows: The causes must, if possible, be ascertained and removed. Tape-worms should be expelled; stomach disorders and poisonings—from lead, for example, and syphilis—appropriately treated. A causal therapy is, however, not always successful. Dietetic and hygienic measures are of great importance, such as light, air, rest, and exercise. Among drugs, iron occupies the first rank and has its chief indication in chlorosis. Laache prefers Bland's pill to any other preparation of iron. Next to iron comes arsenic, which is the best remedy for those profound forms of anæmia known as pernicious. We know little positively about the *modus operandi* of iron in anæmic conditions; still less about that of arsenic. It is, however, a fact of great practical importance that iron exerts its most beneficial effect in those cases of anæmia in which the relative percentage of hæmoglobin is reduced. The type of these conditions is chlorosis. On the other hand, arsenic acts with most effect in those cases in which the relative percentage of hæmoglobin remains normal or is actually increased. The type of these affections is pernicious anæmia. Besides these drugs, hydrochloric acid, eucalyptus-oil, codliver-oil, inhalations of oxygen, and transfusion of blood may be of decided service. Blood taken by the stomach is a very indigestible substance (on account of the fibrin?), and therefore the practice of drinking it at slaughter-houses is not to be commended. Bozzolo, of Turin, who has treated a large number of cases of profound anæmia caused by the *ankylostoma duodenale*, found thymol, in doses of 8 to 12 grammes (2 to 3 drachms) daily, a very effective vermicide. According to Bozzolo, these parasitic anæmias are to be distinguished from other forms of profound anæmia by the absence of retinal hæmorrhages.

LEUCOCYTHÆMIA AND PSEUDOLEUKÆMIA.

The thorough study of a single case does more to elucidate the pathogenesis of a disease than dozens of mere clinical reports, and, as a necessary consequence, the impalpable possession known as experience does not depend so much upon the quantity as the quality

of the material on which it is based. These remarks are suggested by Albin Koettwitz's report⁴_{Sept.1} of a case of splenic leukæmia in which peptonuria was constantly present. Starting from this fact, he constructs a theory of leukæmia, which is, to say the least, as closely reasoned and as plausible as any with which I am acquainted. The following is a brief outline of the argument. The peptone formed during digestion has been shown by Hofmeister's researches to be mostly changed, as soon as absorbed by the mucosa, into other forms of albumen, probably belonging to the class of globulins. A portion of the peptone is absorbed by the leucocytes, which are increased in number during digestion, and conveyed by them into the circulating blood. In the fasting state the adenoid tissue of the gastro-intestinal wall contains but a moderate quantity of leucocytes. During digestion, while the gastric mucosa is inundated with peptone, the cells are enormously increased, and, since the proportion of leucocytes in the blood is a nearly constant one, it follows that old cells must die as the new ones are formed. In leucocythæmia, according to the theory of Koettwitz, the destruction of old cells does not keep pace with the excessive formation of the new, and this excessive histogenesis is due to a loss of power on the part of the digestive apparatus to convert peptone into globulin, peptone being believed by Koettwitz to be a substance which increases the formation of leucocytes by cell division. It is difficult to give the pith of an elaborate physiological argument in few words; but from the above I think it will be evident that Koettwitz believes leucocythæmia to be due to an exaggeration of normal digestive processes. His article is certainly a most suggestive one.

Kelsch and Vaillard⁵⁰_{Sept.26} describe a bacillus found by them in the blood of a case of lymphatic leukæmia during life, as well as in the glandular tumors removed post-mortem, but do not express the opinion that it is the cause of the disease.

Bohland and Schurz⁴¹_{Nov.10} have determined the excretion of uric acid in 3 cases of leukæmia and found it decidedly increased. The proportion between the quantity of nitrogen contained in the excreted uric acid and the total amount of nitrogen in the urine was also decidedly altered. In health this is about 1 : 20, whereas in the cases stated it was 1 : 9, 1 : 12, and 1 : 24.

Saenger⁴⁰_{Sept.} reports a remarkably interesting case of leukæmia

in a pregnant woman, the parallel to which was published by J. C. Cameron, of Montreal, in 1888. In Saenger's case premature labor had to be induced on account of unbearable distension from simultaneous enlargement of spleen and uterus. "All the blood preparations from the placenta were leukæmic, while those from the cord were normal." Saenger states that Cameron's observations and his own "have proved, beyond any possibility of doubt, that intra-uterine transmission of leukæmia from mother to child does not exist; but it still remains an open question whether or not an hereditary predisposition may be transmitted which may lead to the subsequent development of the disease." In his case he says that nature has furnished an experiment "whereby it is evident that *leucocytes cannot pass through the placenta from mother to child;*" and he draws the inference that the passage of "cocci, bacteria, spores, etc.," from the blood of the mother to that of the child is equally impossible. In the same article Saenger reports a case of congenital leukæmia, the child being still-born in the thirty-second week. The blood of the child showed a ratio of one white to three red corpuscles, but unfortunately the mother's blood was not examined. Saenger's article is translated into English by Cameron, who, in a note, states that his own patient has since been confined twice, both children dying shortly after birth. "The patient herself was in such a critical condition during her last pregnancy that premature labor had to be induced at the seventh month."

Norbert Ortner, ⁸_{Aug. 28 et seq.} in a series of nine papers, treats of the diagnosis of leukæmia and pseudoleukæmia. While nothing actually new is added to our knowledge of these diseases, the existing facts concerning them are arranged in a systematic manner and discussed in all their diagnostic bearings. The article is recommended to all students of blood diseases, for it is not only the best on the subject of which it treats, but contains besides a mass of information upon collateral branches.

Hermann Suchanek ⁶⁶_{Oct.} has made a careful study of the nasal mucous membrane in a well-marked case of leukæmia,—red corpuscles, 301,600 per cubic millimetre; white corpuscles, 306,100 per cubic millimetre. The report of his case is introduced by an interesting historical *résumé* of the views concerning the pathogenesis of the disease, in the course of which he expresses sur-

prise that no attention has been given to the appearance of the nasal mucous membrane,—a region containing considerable adenoid tissue. He found, in his case, “a perfectly normal condition of olfactory epithelium, accompanied by a total destruction of the glandular apparatus.” This observation, says Suchanek “can be judiciously used to determine whether the Bowman glands are necessary for the perception of smell,”—a decidedly ambiguous statement, for he goes on to express his regret that no examination of the sense of smell was made during the lifetime of the patient.

Fränkel⁴¹_{Nov.13} reports a fatal case of medullary leukæmia in a girl 14 years old, the most striking post-mortem change being a diffuse leukæmic infiltration of the kidneys. In the discussion of the specimen, Fürbringer stated that he had observed similar appearances in kidneys from non-leukæmic patients, and Litten remarked that sarcoma of the kidney might exist in the form of a diffuse intertubular infiltration.

Gabriel Roux²¹¹_{June 29} made a careful study of the leucocytes in a well-marked case of leukæmia, with special reference to the condition of their protoplasm and their nuclei. He follows Ehrlich's classification of the granulations within the leucocytes into eosinophile, amphophile, basophile, and neutrophile. The chief fact resulting from his careful research is a deficiency of chromatine in the large mono-nuclear leucocytes.

Quincke⁴¹_{Feb.24} found the blood in a case of leukæmia (one white to three red) to be of cinnabar-red color, turning rapidly darker. He believes the vessels in leukæmia to be overfilled with blood. He observed a rapid recession of all the symptoms of leukæmia, after the onset of general miliary tuberculosis, and the same antagonism between miliary tuberculosis and leukæmia has been noticed by Stintzing.⁴¹_{Feb.24}

Limbeck¹³_{Mar.15} has found the number of leucocytes increased in all inflammatory processes attended with exudation into the tissues, such as pneumonia, pleuritis, peritonitis, meningitis, and erysipelas; while in typhoid fever, septicæmia, and intermittent fever this “inflammatory leucocytosis” was absent. Later researches, in collaboration with Pick,¹¹³_{June 29} have demonstrated that inflammatory processes excited by the tubercle bacillus are not attended with leucocytosis. This negative fact enabled Limbeck to decide in

3 cases of meningitis that the process was tubercular,—an opinion confirmed by the autopsy. Von Jaksch has confirmed Limbeck's statements, and based a diagnosis of pneumonia, confirmed by the subsequent course of the case, upon the presence of leucocytosis and peptonuria and the absence of chlorides from the urine. The usual physical signs of pneumonia were wanting. In a case of typhoid fever, von Jaksch also observed a marked leucocytosis coincident with the onset of an intercurrent attack of empyema. These facts certainly are of great clinical interest.

Senator ⁴_{Jan.27} reports a case of leukæmia acutissima complicated with ulcerative endocarditis of the aortic valves, permitting regurgitation. The most striking phenomenon in the case was a centripetal venous pulse, plainly visible in the veins of the back of the hand, and disappearing on pressure upon the distal portion of the vein. Senator explains the anomaly by a "diminished elasticity of the walls of the arteries, always present in aortic insufficiency, combined with a relaxation of the muscular tone of the vessels, which permits the blood to enter the veins in waves instead of in a constant, even stream." The patient was a woman, aged 45, who had suffered for years from menorrhagia.

A. Westphal ³⁴_{Jan.7} reports a case of acute leukæmia in which the fatal event was precipitated by a puncture of the spleen, which was made for diagnostic purposes. At the necropsy the spleen was found enveloped with a large blood-clot. No large vessel was injured by the puncture, the hæmorrhage being explained by the constitutional condition. Extravasations had previously occurred in the skin, as well as bleeding from the gums and intestines, and Westphal naturally deprecates the employment of explorative puncture in such cases. Cultures of the material obtained during life from the spleen, as well as of the blood and marrow procured post-mortem, yielded negative results, and this has been the case with all similar experiments performed in Erb's clinic at Heidelberg, from which Westphal's case was reported. The patient in question was a boy of 16.

Tyson ¹⁶¹_{Jan.} made a case of splenic leukæmia the subject of a clinical lecture, the patient being a male and the proportion of white to red corpuscles being as 1 to 5.

McNutt ⁷⁷_{May} reports a case of "leucocythæmia with lymphadenoma," although there seems no very good reason for such a

designation. The case, judging from the brief report, seems to have been one of lieno-lymphatic leukæmia.

Leonard Weber, of New York, ¹⁵⁰_{Nov.} reports 5 cases of pseudo-leukæmia, and refers to 4 others which have come under his observation. Of these 9 cases only 1 was a female. The most interesting of the series was an Italian, who presented all the prominent symptoms of the disease, such as enlargement of spleen, liver, cervical and other superficial lymphatic glands, and who, receiving a gloomy prognosis of his case, decided to die in Europe. About a year later he returned to New York completely cured, his treatment, according to his statement, having chiefly consisted in an energetic course of purging and sweating for about two months. Neither malaria nor syphilis could be regarded as an etiological factor in any of Weber's cases except in the Italian just mentioned, who had presented symptoms of malarial poisoning before those of pseudoleukæmia were observed.

Stanislaus Klein ⁴_{Aug.} reports a case of pseudoleukæmia complicated with cirrhosis of liver and with fever of remittent type. While under observation the patient, a woman aged 51, had two febrile relapses, each accompanied with swelling of the enlarged glands. Klein suggests the probability of a causal relation between pseudoleukæmia and cirrhosis on the ground that it is very common in the former disease to find a cellular infiltration between the acini of the liver. If life were spared, this cellular deposit would probably develop into connective tissue. Numerous cocci closely resembling the streptococcus pyogenes were found in the glands, most abundantly in the cortical substance. Similar organisms have been found in this disease by Majocchi and Picchini and others, and Klein, taking these in connection with his own observations, believes it to be of parasitic origin.

THE SPLEEN.

Anatomy and Physiology.—Certain facts, especially the congestion of the spleen in the various infectious diseases, support the belief that this organ is a species of filter in which micro-organisms are detained and destroyed. To determine this question, von Kurlow ¹³_{May} injected various microbes into the bodies of rabbits, some of which were sound, while others had been deprived of the spleen. The result was that the organisms disappeared from the

blood of the latter as rapidly as from that of the former, and therefore the spleen is not specially concerned in eliminating them. Similar experiments by Martinotti and Barbacci¹³_{May} led to similar conclusions. They injected the anthrax virus into rabbits and guinea-pigs, some sound, others minus the spleen, and found the course of the disease identical in both sets of animals. Different results were obtained by Bardach,²¹²_{Feb.} who experimented on dogs. These animals are known to possess an immunity from anthrax and to survive the operation of splenectomy. Bardach inoculated 50 dogs with anthrax, 25 of the animals being sound and the remaining 25 being minus the spleen. Of the second set 19 died, while of the first set only 5 succumbed. As all the animals were under the same hygienic conditions, Bardach concludes that the absence of the spleen diminished the powers of resisting the infection. Beorchia-Nigris³¹⁹_{Dec. 21, '99} has studied the alterations produced in the spleen by injections into its parenchyma. The effect of the procedure, which seems to depend rather upon the quantity than the quality of the material employed, is to produce a solution of continuity, of triangular or rectangular form, filled up with young connective tissue. This tissue is derived from the adherent omentum, so that, in case the omentum does not become adherent, the cicatricial formation is absent. After the statement that the effect of intra-splenic injections is independent of the nature of the fluid employed, it seems to me contradictory to recommend that, in the treatment of chronic tumors of the spleen, irritating or even caustic solutions, such as Fowler's solution of arsenic or 30-per-cent. solution of chloride of sodium, be injected into the enlarged organ.

Claude Wilson²_{Apr. 5} reported to the Clinical Society of London 6 cases of enlarged spleen occurring in three generations of the same family. He was unable to decide whether they were to be regarded as inherited malaria, as "hereditary predisposition to slight miasmatic influences, or whether they were not really examples of some hitherto unrecognized morbid condition."

Little⁶_{Apr. 12} exhibited before the Pathological Society of London sections from an enlarged spleen, obtained post-mortem from an infant aged 11 months, the enlargement having been detected at the age of 5 months. There was no sign of leukæmia and no evidence of syphilis or glandular enlargement. Microscopically, the splenic tissue was found to be normal.

G. S. Robinson ²_{Feb.22} reports a non-malarial enlargement of the spleen occurring in a soldier, and suggests that pressure from the belt may aggravate the condition, "if it does not actually produce it."

A case of extrémé atrophy of the spleen, without symptoms referable to that organ during life, is reported by Thomas Savill. ⁶_{July 26} The patient was a female aged 43, who died of pulmonary phthisis, the course of which, so far as observed, was unattended with fever. The spleen weighed only 56 grains (3.63 grammes) and measured $1\frac{3}{8}$ inches by $\frac{1}{8}$ inch by $\frac{1}{5}$ inch. Savill suggests that the absence of fever "may in some way have been connected with the atrophic condition of the spleen."

Tumors and Abscesses.—A specimen of cancer of the spleen, apparently primary, is described by J. Wigglesworth. ¹⁸⁷_{July} Huber ³⁴_{Feb.} reports a case of hydatid cyst of the spleen which communicated with the colon. The passage of numerous cysts per rectum, taken in connection with a tumor the size of the fist projecting below the ribs, made the diagnosis comparatively easy. The patient was a woman aged 43.

A case of splenic abscess is reported by J. M. Flippin, ⁷⁶⁰_{Mar. 2} who removed 9 pints (4500 grammes) of pus by cutting down upon the enlarged organ. Three months after the operation the patient's health was thoroughly restored.

Hodenpyl ⁵⁹_{Aug. 2} presented a specimen of abscess of the spleen to the New York Pathological Society, the patient having died of chronic Bright's disease. There was no evidence of infarction, the heart being in a normal condition.

Rupture.—R. T. Darwin ²⁰⁶_{July} reports a case of rupture of the spleen, the patient being a young, robust-looking Sepoy about 21 years of age. The accident was caused by a fall on the side, presumably the left, in attempting to mount a horse. Death occurred from hæmorrhage in the course of half an hour. Two distinct points of rupture were found in the spleen, which was not more than "twice the size of an ordinary healthy one."

D'Arcy Power ²_{Feb. 8} relates the case of a woman aged 42, whose spleen was ruptured by falling from a window a distance of 30 feet. Death did not occur until ten weeks after the accident. "The rent had passed quite through the organ and had involved the capsule, and was found to have been closed by a firm white

scar." The quantity of hæmorrhage is said to have been small, and, as repair of the splenic rupture had taken place, the cause of death is not apparent. The case is of great interest as illustrating the possibility of recovery from extensive laceration of the spleen.

Therapeutics.—The literature of the therapeutics of splenic affections during the past year has been very scanty; in fact, it may be comprised in an article by Fr. Mosler,⁸¹_{Jan. 18} on the local treatment of chronic tumors of the spleen. This treatment consists of the intra-splenic injection of Fowler's solution,—a procedure which, says Mosler, should not be undertaken without observing the following precautions: 1. It is only applicable to tumors of firm consistence, which are neither associated with a high degree of anæmia nor with a hæmorrhagic diathesis. 2. The method should be preceded by the internal employment of drugs ("milz-mitteln"), which are believed by Mosler and others to exert a specific action on the spleen. Among such drugs are piperin, oil of eucalyptus, and quinia. Immediately before and after the injections ice should be applied over the splenic region. Mosler has treated several cases of splenic leukæmia in this manner, injecting as much as a Pravaz syringe-ful of Fowler's solution at a time. In the course of eight weeks one of his patients received ten such doses. While no case of actual cure of leukæmia is reported by this method, Mosler is convinced that it not only diminishes the size of the enlarged spleen, but also modifies favorably the course of leukæmia.

THROMBOSIS AND EMBOLISM.

Beugnies-Corbeau³⁷⁸_{Apr. 24; May 19} contributes an elaborate article with the above title, his text being 2 cases,—one of embolism resulting in gangrene of the left leg, the other of venous thrombosis of both lower extremities. Both cases occurred during the late epidemic of influenza, and therefore the author, collating them with several others of the same sort, inclines to the view that intra-coagulation of blood is of microbic origin. The article contains a good *résumé* and analysis of the various theories of thrombosis and embolism.

Löwit¹³_{July} has studied the relations of the white cells to the process of coagulation, and, contrary to the opinion of Wooldridge, believes them to be most intimate. He used in his investigations

the blood of the river-crab ("Flusskrebs"), which contains two kinds of white cells,—the one finely, the other coarsely, granular. The former seems to be most closely concerned in coagulation, and undergoes a series of definite changes, called by Löwit *plasmochise*. These are minutely described in the article of Löwit, whose previous work entitles his views to the most careful consideration.

Beneke²⁸²_{July} believes, as do many others, that the condition of the vessel-wall has much to do with the intra-vascular coagulation of blood. It is well known that blood contained in a vessel between two ligatures may remain fluid almost indefinitely, if the experiment is performed aseptically. This, however, only occurs if the vessel-section is full of blood. If the vessel is collapsed at the time of ligature, and therefore contains little blood, proliferation of the cells of the intima and coagulation occur *pari passu*; whereas when the vessel is distended with blood the cells of the intima remain unchanged.

TRANSFUSION.

Stadelmann and Gorodecki³⁴_{July 22} have found that subcutaneous and intra-peritoneal injections (in animals) of pure preparations of hæmoglobin are innocuous, confirming Kuntzen's earlier researches. Hæmoglobinuria and other serious symptoms which have resulted from this procedure were doubtless due to an impure preparation of hæmoglobin. Verrier¹⁶⁴_{May 29} advocates direct transfusion by means of the apparatus of Roussel, of Geneva. J. J. Putnam⁹⁹_{Dec. 12, '99} describes a new apparatus for direct transfusion. Renleaux²⁹³_{Oct.} gives an interesting *résumé* of the different modes of transfusion. Robert Haggard performed direct transfusion successfully with Aveling's apparatus. The treatment was heroic in the fullest sense of the word, for the operator transfused more than a pint of his own blood, only ceasing when threatened with syncope.

Cases of transfusion are reported by Worrall²⁶⁷_{Feb.} and Carter,¹⁷_{Sept. 19} the latter successful, the former not.

SCURVY.

The literature of scurvy for the year 1890 is very scanty, cases being reported by J. B. Walker⁷⁶⁰_{July 26} and Morris Longstreth.⁷⁶⁰_{Apr. 96}

W. T. Gairdner⁶_{Jan}, dissents emphatically from W. Koch's view of the identity of scurvy and purpura hæmorrhagica.

DISEASES OF THE UTERUS, PERITONEUM, AND PELVIC CONNECTIVE TISSUE; DISORDERS OF MENSTRUATION.

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PELVIC DISEASE.

General Considerations.—The great prevalence of pelvic disease is considered by James K. King²³_{Sept.} as the result, in great measure, of certain remediable factors: First, is the false modesty shown in the education of young girls. They are taught absolutely nothing of their special anatomy or generative functions, or of the hygienic laws governing them. The result is that they frequently arrive at maturity, advanced womanhood, or the marriage relation, with uncomfortable and distressing conditions such as leucorrhœa, erosions, ulceration, and hyperæmia, which might have been avoided had they understood the simple laws of health and cleanliness in regard to this part of their bodies. The next most generally admitted factor is constipation. Care and watchful teaching on this point would often avoid this trouble and its serious consequences. Indolent habits and the consequent want of muscular development is another most potent cause. All of these points are emphasized by Le Page,²⁶_{Dec. 2, 1899} Root,¹⁰⁶⁰ Wilkins,⁴⁴_{Apr.} and Kellogg.⁹_{Nov. 8} The latter urges especially proper dress (see ANNUAL for 1890) and properly graduated exercises, which he considers a most important therapeutic means in the management of a large class of pelvic disorders. He employs, in general, light calisthenics, consisting of free-hand and body movements, and the use of wooden dumb-bells, Indian clubs, wands, chest-weights, and various gymnasium apparatus for bringing into play special groups of muscles; walking exercises, breathing exercises, and Delsarte; also, light exercise on the trapeze, swinging-rings, and horizontal bars in

suitable cases. The weight of the apparatus used and the duration and amount of the exercise are carefully prescribed for each patient. Variety is important, as it not only encourages patients to take a larger amount of exercise than they would otherwise do, but enables them without injury to bring into play different groups of muscles. Those exercises which bring into play the muscles of the waist, abdomen, and pelvic floor are particularly valuable. Deep abdominal breathing while in the genu-pectoral position is important. As the result of carefully-prescribed and systematic exercise the author has accomplished remarkably good results; thus, the average gain in general muscular strength after four months' work was in 100 women over 50 per cent. In many the increase was from 200 to 400 per cent.

G. H. Noble,¹¹⁷ Mar. Lycett,⁴⁹ Aug.;²⁶ Aug. Joseph Price,⁶¹ Nov.1 and Henry K. Leake¹⁰⁶¹ all call attention to the necessity for care and proper skill in the diagnosis and treatment of minor gynæcological troubles, lest, instead of cure, major troubles result. Leake speaks particularly of the abuse of local examination in young girls, of too severe and frequent intra-uterine applications, of the unnecessary use of the sound, of attempted surgical measures by tyros. Though all these points have been made many times, they are none the less worthy of attention. While they do not militate against skilled and reasonable gynæcology, they emphasize the dangers which accrue to the patient from treatment by officious or ignorant physicians just as similar points would in any other department of medicine.

Neuroses of Pelvic Origin.—The most frequent illustrations of peripheral irritation resulting from intra-pelvic disease in women are, according to C. C. Lee,¹ July 6 disturbances of surface temperature; neuralgias, such as spinal irritation, spinal ache, sciatica, and migraine; special forms of headache, such as pressure on the vertex while the rest of the head is unaffected; neuroses of the gastro-intestinal canal, including the familiar example of the persistent vomiting of early pregnancy; neurotic conditions of the breast, sometimes of the most aggravated character; genito-reflex irritation of the respiratory tract, producing not only occasional dyspnœa, but unmistakable attacks of asthma; hysterical affections of the joints and of the organs of special sense. It is futile to treat these evidences of peripheral irritation as diseases.

They are, like all neuroses, only symptomatic of disease elsewhere, and only by combining the appropriate local treatment of that with general treatment can we hope for success. Malconditions of the uterus exert far more influence in these directions than disease of the appendages. Undoubtedly we often find a salpingitis, oöphoritis, or cystic or fibrous degeneration of the ovaries in these cases. But, however thoroughly these are treated, the neurosis will almost surely persist until the accompanying uterine disease has disappeared. In neurotic conditions removal of the uterine appendages is not only useless, but often leaves the patient worse off than she was before. The appendages should be removed if serious disease of their structure is unquestionable, but not otherwise. The accompanying uterine disease should always receive most anxious care. Robert Barnes²⁶_{Nov.} holds very similar opinions. C. W. Smith²⁷_{Nov.} notes several instances of vasomotor neuroses dependent on pelvic disease and cured by its removal. C. M. Hay⁵⁹_{Nov. 15} reports a case of insanity the result of pelvic abscess, and cured by its surgical treatment. R. C. Bennington⁴⁹_{Feb.} describes a case of melancholia of pronounced type, dependent on a retroversion and relieved by its replacement, which re-appeared every time that the uterus was allowed to fall back to its old position. Thomas Savage,²_{Aug. 2} S. T. Lowry,⁸⁵_{Dec. 7, '99} and Odebrecht note similar instances. Launey²_{July 19} writes particularly of the neurotic vomiting of puberty, menstruation, coitus, or the menopause, and its usual association with some uterine disorder.

Organic Heart Disease with Disease of the Pelvic Viscera.—E. H. Sieveking²_{Dec. 14, '99} calls attention to the frequent association of heart disease and pelvic disease, and to the great predominance of mitral stenosis over all other cardiac lesions in such cases. Twenty-six and a half per cent. of his patients suffered from organic heart trouble, and of these 84 per cent. had mitral stenosis, 26 per cent. mitral regurgitation, and 10 per cent. both combined. This is certainly an extraordinary proportion, and one which no other writer has as yet noted.

MENSTRUATION.

General Considerations.—Eug. Anderson,¹⁰⁰⁰ from a study of the phenomena of menstruation in 1220 women of Australia, finds that where menstruation commences much later than usual, the average duration of its activity is two and two-thirds years less and

the age at which it ceases is six months less than the average; while, if it begins much earlier than customary, its average duration is three and one-sixth years more, and the age at which it ceases is six months more than the average of all cases. In this he agrees with Playfair and others that the earlier menstruation begins the longer it lasts, early menstruation indicating an excess of vital energy. In early menstruation he found the flow more regular, lasting a shorter time, accompanied by less pain, and varying from the normal less often than in later menstruation. He noted menstruation at $8\frac{1}{2}$ years in one girl. Another instance of its precocious appearance is reported by Stalkartt, ²_{Apr.12} whose patient began to menstruate at the age of $7\frac{1}{4}$ years.

Endometrium During and After Menstruation.—This subject has been studied by von Kahlden, ³¹⁷_{Feb.1;} ⁵_{May} who states that immediately after menstruation large gaps are seen in the superficial layer of epithelium, and that during menstruation the entire epithelial layer is cast off, and that there is infiltration and hæmorrhage into the mucosa. This infiltration may extend through two-thirds of the thickness of the latter. The blood-clots which are found within the uterus contain desquamated epithelium and glands. No true solution of continuity of the endometrium can be established. He has never been able to find the giant-cells described by Leopold, or evidence of dilatation and tortuosity of the glands. The reproduction of epithelium begins *de novo* within the glands, not from islands of cells which were not cast off; there is also a new formation of blood-vessels.

Ovulation and Menstruation.—Cohnstein ⁶⁹_{Aug.21} states that there is a causal relation between the ovarian and catamenial functions. The processes in the ovary precede and cause those in the uterus. Where the ovarian activity is quiescent no menstrual hæmorrhage occurs, nor any change in the uterus which may be traced to catamenial processes. Ovarian activity may occur without menstrual hæmorrhage. We diagnose the functional powers of an ovary by its reaction upon irritation. The effect of irritation is manifest in certain alterations of the general system and of the uterus, the terminal link of the chain being menstrual hæmorrhage. The ovaries seem to alternate in the production of ripening follicles. It is not proven that Graafian follicles may burst at any time, and Cohnstein believes that this occurs only at the menstrual crisis.

Menstruation After Ovariectomy.—The following physiological conclusions regarding the continuance of menstruation after removal of both ovaries are formulated by R. Engelmann, ²³_{v.3,p.309} who, after a careful study, believes (1) that it is due to remnants of ovarian tissue left *in situ*; (2) that bits of ovarian tissue, however small, remaining after oöphorectomy or oöphoro-salpingectomy, *may* retain their functional activity; (3) even elongated pedicles may retain ovarian stroma in which functional activity may continue; (4) remnants of ovarian stroma do not *necessarily* preserve their functional activity; (5) the ovary is an essential factor in the functional life of woman, and menstruation is inseparable from ovarian activity. Practical deductions are: If menstruation is to be checked and the menopause produced, it is necessary that every particle of ovarian tissue be removed. If limitation of hæmorrhage, shrinkage of fibroids, or cessation of annoying symptoms is to be produced with certainty, both ovaries must be completely removed. Where double oöphorectomy is necessary in women not yet past the climacteric and not suffering from uterine reflexes, such healthy ovarian tissue as may exist should be spared in order that functional activity may remain.

Psychical Disturbances.—Alan ²⁴_{Mar.2} calls attention to the fact that psychical disorders in women are greatly modified by puberty, menstruation, and the menopause; disturbance of the will, judgment, and normal instincts being present or exaggerated at these times. These conditions are important in relation to the performance of public duties, which they may prevent or interfere with.

Neuroses.—Bayer, ¹³⁶_{July 15}; ⁶⁷³_{Sept.} in calling attention to the relation between the genital system and the vocal apparatus, notes the case of a young girl suffering from tuberculosis of the larynx, where, at each menstrual period, dangerous laryngeal œdema appeared for a few days.

Frank ⁴¹_{June 23} records the case of a woman who, at each menstrual period, was attacked by very severe urticaria, which covered the entire body within two hours. Upon examination there was found a cord-like thickening of the left tube and some enlargement of the corresponding ovary. These were removed for severe pelvic pain and the urticaria disappeared. Frank has also removed a uterus for pruritus uteri.

Herpes Menstrualis.—Bergh, ³¹⁷_{Feb.8}; ⁵_{May} from an experience of twenty-

four years in the Hospital for Venereal Diseases in Copenhagen, finds that 2.6 per cent. of prostitutes have *herpes vulvaris*. Out of 877 cases of herpes, 73.4 per cent. of the women were menstruating when examined, and many stated that they had the eruption only at the time of their period. It had no apparent connection with previous venereal troubles, or with their practice of indulging in sexual intercourse during the flow. Bergh believes that vulvar herpes is nearly always a menstrual exanthem, probably of trophic origin. The vesicles are most numerous immediately before the flow. They appeared in 70 per cent. of the cases on the labia majora.

Vicarious Menstruation.—Cases have been noted by Kerr,¹⁴⁷_{Dec., '89} and Corkins,¹⁹⁹_{Nov.} who describes a case where there was monthly bleeding from tongue, gums, lungs, and from an eruption resembling measles on the inner surfaces of the thighs.

Retardation of Menstruation by the Use of Bromides.—Ernst¹³²_{Jan.} reports several cases of epileptical women where the interference with menstruation could not be attributed to the epilepsy itself, but seemed to be directly due to the action of the bromides.

Menstrual Tampon.—The use of an absorbent-cotton tampon during menstruation is advised by Parsons,¹_{June 14} in the place of the usual napkin. For obvious reasons its use is confined to married women. Parsons states that it may be left *in situ* for twenty-four hours, unless sooner saturated, when it should be removed and the vagina washed out with a warm antiseptic solution by means of a fountain-syringe, and a fresh tampon introduced. This procedure should be continued until the flow ceases. The principal disadvantage of this method is the difficulty of using the speculum and preparing and introducing the tampon; but he has met with no case where one or two lessons did not teach the woman the *modus operandi*. Its advantages are many. There is entire absence of odor, no necessity of wearing the napkin, and the sense of support to the uterus afforded by the tampon is immediate and exceedingly grateful. Many women who had formerly to remain in bed for one or more days can, with this method, attend to their usual duties without fatigue. In many cases of menorrhagia this procedure has modified the flow and contributed to a complete return to normality.

A similar procedure is said by Wernick,¹_{July 26} to be universally employed by the women of Japan, who carry for the purpose a

provision of soft white paper, from which a piece is torn, rolled into a ball, and inserted into the vagina, to be replaced when saturated.

Menstrual Retention from Imperforate Hymen.—Cases are noted by Mayo Robson,²⁶_{Jan.} Macdonald,²_{Feb. 22} and Allinson,²_{Apr. 5} in all of which operation by incision and evacuation of the retained menstrual accumulation, with strict antiseptic precautions, was followed by relief and uncomplicated recovery.

Amenorrhœa.—Herman,⁶_{Oct. 11} in discussing this subject, says: Cases are common in which menstruation is absent without producing any kind of disturbance of health; and I see no reason for supposing that in these particular cases the suspension of the function should have a different result. The symptoms form a group, all connected together, just as are the symptoms of chlorosis, of phthisis, or of exophthalmic goitre. The absence of menstruation is simply part of a constitutional state. There is no kind of local treatment that will establish menstruation. It is easy by treatment to make the uterus bleed; but uterine hæmorrhage is not menstruation. It is possible to carry out local treatment on patients who, in consequence of treatment of other kinds, or of the recuperative force of nature, are getting well; and in such cases it may seem as if the re-establishment of menstruation were due to local treatment. But there is no treatment from which the re-establishment of menstruation can be predicted, and this is the test by which in practice we must distinguish between cause and effect and mere coincidence. Change, fresh air, exercise, food, and tonics are the great therapeutic agents. Of these change is the essential. It is easy to prescribe exercise, but not so easy to get the patient to take it while she remains in her accustomed surroundings. It is easy to order food, but dislike to food is one of the most troublesome symptoms. Tonic medicines are very good, but in this condition are the least important. Complete change, and that to surroundings in which the other indications can be complied with, is the great thing. The patient should be in a healthful place, with cheerful companions able to persuade her to exercise, and to tempt her appetite by the resources of cookery. If this can be carried out recovery will in young subjects almost always follow.

Reamy,⁴²⁶_{May} in discussing the amenorrhœa of anæmia common

in school-girls, says: First, she must leave school and must not even study at home. Second, she must spend several hours each day in the open air, walking or riding. In winter she must, of course, be warmly clad, but must wear no sheep-skins or other chest-protecting pads. Standing in the open air she must be induced to breathe deeply with the mouth closed; this should last for at least fifteen or twenty minutes, and be repeated at least twice each day. Nothing that can be done will more rapidly improve the character of her blood. Third, she must sponge her body and extremities every morning immediately on arising from bed. The water must be of the temperature of her room, and she must practice frictions freely, with an ordinary towel. Fourth, she must drink plenty of milk and eat plenty of beefsteak. Fifth, she must take small doses of iron, in combination with some bitter tonic, three times a day. Improvement may be somewhat slow, but if this course is faithfully carried out a perfect cure will result, and she can then finish her education.

If this course or its equivalent is not carried out these cases are apt to go from bad to worse, and finally die of pulmonary tuberculosis.

Duke, of Dublin (collaborator), advocates the mechanical treatment of amenorrhœa by the introduction and wearing of an intra-uterine pessary, he having devised a flexible, spiral, wire stem which has given good results in his hands.

Raciborski,²⁰²_{Mar. 25} in an elaborate paper on emmenagogues, classifies them as follows: 1. Simple general excitants. These will sometimes be followed by the appearance of the menses when there has been retardation in the last act of ovulation. An augmentation of the heat of the body, a slight acceleration of the circulation, may then suffice to rupture the capillaries already engorged with blood under the influence of the orgasm. Anæmic cases are sometimes markedly benefited by iron and arsenic, which, however, have only a general action. 2. Certain medicinal substances having a special action on the uterus, the rectum, or the bladder, as savin, rue, aloes, cantharides, etc. The excitation which these medicaments produce on the organs contiguous to the ovaries may easily extend to the latter. Let this coincide with the conditions of ovulation such as we have just supposed, and the excitation will suffice to rupture the full vesicle and provoke

the menstrual hæmorrhage. 3. Psychic agents, as contact with men, the reading of romances, sexual excitations, etc.

Raciborski also states that as we know that the external tissue of the ovaries is composed of muscular fibre, and that the Graafian vesicles most advanced toward maturity are surrounded by such fibres in the bulbous portion, we are warranted in having faith in the good emmenagogue effects of strychnia, which may give vigor to the muscular contractility when this is affected with atony, and act favorably on ovulation. The few trials which have been made with strychnia in amenorrhœa seem to warrant the more extensive use of this drug.

Linhart¹¹³_{Dec. 8, '89} finds that sodium salicylate has a very marked congesting action upon pelvic organs, and that it possesses considerable power as an emmenagogue.

Menorrhagia and Metrorrhagia.—A careful chemical and physiological study of the derivatives of hydrastis has been made by Falk¹¹⁶_{Jan. ; Feb. '80}, who finds that hydrastinine possesses all of the beneficial with the least of the poisonous properties of the drug. He has employed it with success in cases of congestive dysmenorrhœa, bleeding from the virgin uterus, essential bleeding, hæmorrhage from diseased condition of the uterine tissue (endometritis, metritis), from parametritis, pyosalpinx, etc., and in myomata. The remedy was the most efficacious in cases of hyperplastic endometritis, congestive dysmenorrhœa, and virgin uterus. The hæmorrhage from myomata may be lessened by the drug. The success is somewhat less in chronic endometritis, in which the uterus is enlarged and the contractility of its muscular tissue lost. Bleeding from severe neurosis does not respond well to the drug. Falk believes that the drug causes contraction of the blood-vessels; through this action on the abdominal vessels less blood flows to the genitalia, causing relative anæmia of the uterus, which acts as an excitant upon the muscularis and causes contraction. He generally employs a 10-per-cent. watery solution of the drug, which keeps well, and injects from 7 to 15 drops, *i.e.*, 0.05 to 0.1 gramme ($\frac{1}{5}$ to $1\frac{1}{2}$ grains) of hydrastinine. Five to six days before menstruation, and in myomata, daily injections of 0.05 gramme ($\frac{1}{5}$ grain) are made; during the bleeding, daily injections of 0.1 gramme ($1\frac{1}{2}$ grains). After 500 injections he has seen no inflammatory reaction follow the procedure.

Wm. Goodell,⁶⁶³_{Nov.} after curetting or for uterine hæmorrhage at other times, speaks confidently of the value of the following :—

R	Extracti ergotæ fl.,	. . . . .	℥x (0.65 gramme).
	Ammonii chloridi,	. . . . .	gr. x (0.65 gramme).
	Sodii bromidi,	. . . . .	gr. v (0.31 gramme).

Misce et signa.

For one dose, to be taken in half a tumbler of water; may repeat every two hours.

Welch⁸⁶⁴_{Dec.} recommends the essential oil of true cinnamon, given in the form of a tincture, as having a marked hæmostatic and aphrodisiac effect.

Hirst¹¹²_{Mar.} speaks enthusiastically of the value of tannic acid applied as a powder to the endometrium, once a day if necessary, for the control of hæmorrhage associated with pelvic inflammation and congestion. This is best accomplished by carrying into the uterine cavity to the fundus, by a delicate intra-uterine forceps, a small pledget of wool well charged with the powder. It is well to employ at the same time ergot by the mouth and tampons of wool soaked with glycerite of tannin. Wm. L. Taylor,¹¹²_{May} in criticising this procedure, aptly says, "Why not curette?"

Hale¹³²_{May} recommends strophanthus in cases of menorrhagia which have been debilitated from profuse menstruation or other loss of blood. The drug is best administered in the form of a tincture (1 in 20) or of the powdered seed. The dose of the tincture is 6 drops every six hours, and of the powder $\frac{1}{4}$ to $\frac{1}{2}$ grain (0.016 to 0.032 gramme) or more at the same intervals.

Davenport⁹⁹_{Aug. 14} states that out of 51 cases of women afflicted with influenza who came under his observation, 3 were pregnant. Of these 1 aborted at eight weeks and 1 miscarried at the eighth month. Of the remaining 48, 45 suffered from metrorrhagia. Of the 3 which did not, 1 was a girl of 16, who had menstruated only a few times, and then only for a day, at intervals of two to three months; another was a young woman who had given birth to a child twelve weeks before and was nursing it. In her case a very profuse leucorrhœa came on, which ceased as soon as the influenza was over. These observations agree with those of Gottschalk,³¹⁷_{No. 3} Müller,³¹⁷_{No. 17} and others. Goodell²³⁴_{July} notes a case of simulated peritonitis following the grippe, probably due to the intense pelvic congestion which was present in many of the cases.

Dysmenorrhœa.—Aleinda Pine¹⁰⁵_{Dec. 15, '90} finds the majority of cases

of dysmenorrhœa in school-girls functional in origin, and formulates the following conclusions: That the environment should be such as would be most conducive to their general health. That they should be kept out of school their first menstrual year, and those of a nervous temperament for a longer period of time. That they should have calisthenic training for the special development of the muscles of the back and abdomen. That they should be warmly clothed, wearing the unspun wool next to the skin, such as the Jaros wear, as it is not bulky and is free from irritating qualities; the objections girls usually make against flannels are met and defeated by this wear. That if there is any tendency to pain during menstruation, the young patient should be put to bed and kept there the entire period.

Rapid dilatation for the relief of dysmenorrhœa depending upon flexion or obstruction is advocated, in the absence of contra-indications, by Goodell, ²³⁴_{July} Dickman, ⁴³⁰_{June} Townsend, ²⁷_{Dec., '89} and More Madden, ⁶⁷³_{Sept.}, ⁶_{Oct. 19} the latter inserting afterward a flexible, spiral-wire stem-pessary. *Slow* dilatation is urged by Talbot ²⁷_{Jan.} and Burbank ¹⁸⁶_{Oct.} as being equally effective and less dangerous.

Among medicinal agents Mitchell ²⁷_{Mar.} particularly recommends apiol, manganese binoxide, and tincture of gelsemium 5 drops every three hours. He also notes good results from glonoin and antipyrin, the latter being also praised by Waugh ⁶_{Jan. 11} and Evans. ¹³²_{Mar.} We have found large doses of phenacetine very efficient in many cases.

Homans and Reynolds ⁹⁹_{Dec. 19, '89} speak favorably of sodium salicylate in 10-grain (0.65 gramme) doses, three times a day, for the week previous to and during menstruation. R. H. Andrews ¹⁷⁶_{June} suggests three remedies for this condition: chloroform, cannabis Indica, and gelsemium. The first may be dropped on a lump of sugar or taken in a little camphor-water in doses of 10 drops every two or three hours, although a single dose is often sufficient. When the pain is excruciating, the vitality much depressed, and the patient suffers from neuralgic attacks, cannabis Indica is the remedy. The method of administration consists in placing 5 drops of an assayed fluid extract in a suitable vessel, and adding to this from 4 to 6 ounces (128 to 192 grammes) of water; the dose of this solution is one teaspoonful every ten minutes for the first hour, and every hour thereafter until relieved. As a rule the pain ceases at

the end of the first hour, but if there is increased activity of the circulation it will be advisable to combine with it about 10 drops of the fluid extract of gelsemium. No change in dosage is required, and it is believed that those who once adopt this practice will not have cause to regret the experiment.

Membranous Dysmenorrhœa.—Lohlein⁵ prefers the expression “exfoliation of the menstrual mucosa” to either “membranous dysmenorrhœa” or “exfoliative endometritis,” since dysmenorrhœa is a prominent symptom in only one-half of the cases, and most observations show that there is no real inflammatory trouble. He believes that the membrane bears more of a resemblance to a product of conception than to that of inflammation.

Among 3000 gynæcological cases in his private practice he noted 25 of so-called membranous dysmenorrhœa, which were subject to a careful and extended observation. In 6 of these the pain was clearly due to para- or peri- metritis, 4 were cases of abortion, and in 4 the menses were suppressed from cold or other causes. Two patients had acute endometritis, and chronic endometritis was frequently noted. Multiparæ usually had but slight pain, as well as nulliparæ, whose cervices had been dilated; in fact, unless the cervical canal was contracted, the symptoms were seldom severe; when the pain was unusually violent, marked disease of the adnexa could usually be detected. Six patients became pregnant. In only one did the phenomenon disappear permanently, though it was sometimes absent for months after thorough curetting and subsequent injections of iodine.

Martin⁹ reports satisfactory results from the following plan of treatment: 1. To relieve the inflammation of the uterus as much as possible between the periods with prolonged hot-water douches, once or twice daily; applications to the interior of the uterus, two or three times per week, of equal parts of 5-per-cent. solution of carbolic acid and Churchill's tincture of iodine; and also the use of tampons saturated with glycerin, hydrastis, or boro-glyceride (10- to 20- per-cent. solution). 2. To correct constitutional disturbances and give nerve and general tonics. Bromides and similar agents generally make patients worse in the end. 3. To divulse the cervical canal from five to seven days before the time for the period, repeating for two or three months; thus making the canal so large that the membrane may be passed with

but little expulsive force. Sometimes after divulsing, inflammatory pains are slightly worse for one or two periods, but in the end it benefits in a majority of cases. 4. To prevent the formation, or to favor disintegration, scrape the uterus thoroughly with a dull curette in the middle of the intermenstrual period, and afterward apply 1-to-300 or 1-to-400 solution of bichloride of mercury to the interior of the uterus once in three or four days and repeat for from two to five months, as may be indicated.

Climacteric Heart Disorders.—This subject has been studied by Kirsch, ⁴ ¹⁶¹ _{Dec. 16, '89; Mar.} who finds one of the most frequent complaints in paroxysmal tachycardia, of which no clinical studies have before been published. This comes usually with the beginning of the climacteric, at which time the woman, whose cardiac functions have previously been normal, begins to complain of cardiac palpitations. The attacks occur even during sleep, more often after some slight exertion; they last for from a few minutes to days, and the intervals of rest vary in the same way. The palpitation is associated with a feeling of fear or terror, constriction of the chest, throbbing of the carotids, violent pulsations of the abdominal aorta, flushes of heat, increased cerebral blood-tension, and severe headaches. There is often severe vertigo or, more rarely, syncope. The pulse is rapid, strong, full, and regular. The heart-sounds are exaggerated. With this local condition the patient lapses into a state of mental and corporal anxiety; she is unfit for regular and continued activity; her sleep is disturbed by disagreeable dreams; and in a general way she suffers from considerable nervous irritability. The cases in which Kirsch has observed this paroxysmal tachycardia ranged in age from 38 to 48 years. They were not anæmic subjects, rather women of full habit, some even plethoric. Symptoms of dyspnœa or cardiac asthma were not present, while symptoms of deranged circulation were exceptionally scarce. Œdema of the feet existed in solitary instances; no albuminuria. The attacks of tachycardia may be very favorably modified by the systematic exhibition of mild purgatives, with light diet, active exercise, and cold sponge-baths. Much as these attacks are calculated to inspire the subject with fear, they are comparatively harmless. Women dread impending attacks, fearing an apoplectic stroke. This fear is unwarranted. The paroxysms may occur at any time during the climacterium and even after com-

plete cessation of the menses, and still Kirsch has never known any ill consequence of moment to follow. As to the causes of this peculiar disorder, we must look upon it, with our present knowledge, as a neurosis of the cardiac nerves, and the question arises, Is it due to an irritation of the extra-cardial accelerator nerves, or to a paresis of the extra-cardial inhibitory apparatus? Kirsch believes that some irritation of the excito-motor fibres is the real cause of the trouble, the cause of the irritation being explained as follows:—

During the climacteric period hyperplasia of the fibrous stroma of the ovary is the characteristic condition of this organ. The periphery of the nerves supplied to the ovaries terminates in this stroma; hence, with this hyperplasia considerable irritation is set up, which is conveyed to the nearest centres, whence, reflexly, the wave of irritation is carried to the cardio-accelerator apparatus.

A second, rarer, but more serious, form of heart trouble is tachycardia with feeble heart. This occurs in women who have been chlorotic, anæmic, or have suffered and are suffering from severe and long-continued menorrhagia. This form of tachycardia differs essentially from the first. The pulse is less rapid, small, feeble, compressible, intermittent, and lacks rhythm. The heart's action is weak and minus energy. The heart-sounds are obscure and at times accompanied by systolic murmurs. In addition to this, they are asthmatic and often attacked by angina pectoris. Symptoms of impeded circulation are manifest, *i.e.*, cedema of the hands and feet, albuminuria. The hæmoglobin percentage is below the normal. These symptoms require careful general treatment and immediate vaginal examination to determine and, if possible, remove the cause of the bleeding.

A third group of cardiac disorders occurring at the menopause is due to the accumulation of fat in the pericardium and subpericardial connective tissue. This is a very common occurrence, and is the result of the general tendency to the deposition of fat in the various tissues throughout the body at this time. The distressing symptoms occasioned by this pericardial fat are principally dyspnœa and palpitation, which supervene upon rapid walking, stair-climbing, stooping, eating, etc. Real asthmatic difficulty and night attacks have seldom been observed. The disorders arising from fatty accumulations around the heart are not so numer-

ous as might be expected, since the heart has been accustomed to accommodate itself to more or less rapid changes in the size of its working-area, which are incidental to puberty, pregnancy, and lactation. Only those women who have, from their earlier years, possessed the tendency to lipomatosis universalis, and in whom it attains excessiveness during the climacterium, find considerable distress occasioned by their condition. Dyspnoea and palpitation are caused by the slightest exertion, and cardiac asthma is not infrequent. In consequence of the diminished force of the heart, venous stasis occurs at various points, particularly in the lower extremities, where it assumes the form of varices, while the superficial veins become dilated and phlebectases occur in the hæmorrhoidal vessels. Œdema of the feet and lungs, albuminuria, etc., are not long in making their appearance at this stage of the disease. The judicious regulation of the diet and the observance of the laws of hygiene will tide the patient over the dangers of this period, even though the symptoms assume serious gravity.

ENDOMETRITIS.

Microbiology of the Cervical Canal.—Researches made by Solwjeoff^{48 Feb.} have shown that, in the great majority of cases of endometritis, micro-organisms are to be found in the cervical canal. In acute puerperal endometritis pyogenic microbes are present. In chronic cervical endometritis the micro-organisms are usually inoffensive, though this fact cannot be determined by clinical examination. It must be admitted that when pyogenic organisms are present they may, under favorable conditions, infect adjacent tissues. There is a possibility of infection after parturition at term by pathogenic microbes which have existed in the genital canal prior to pregnancy.

The Rational Limitation of Intra-Uterine Therapeutics.—This has been discussed by Currier,^{1002 Feb.} who formulates the following rules: I. When menstruation is imminent or present, treatment should be withheld. An exception to this rule would obtain should the flow be very profuse or protracted. II. In the presence of an acute inflammatory process intra-uterine treatment should be withheld. For example, in the acute stage of gonorrhœa or with acute peritonitis this rule should be observed. III. In malignant disease of the cervix, the possibility of severe hæmor-

rhage attending local treatment of whatever character must be anticipated and provided for. IV. In all cases the risk of inflammatory reaction in pelvic structures remote from the cervix must be taken into consideration.

Trélat⁴⁸¹⁴⁷_{May; July} holds more radical views, believing that by the treatment of endometritis certain complicating peri-uterine inflammations will be cured also. His treatment of endometritis, irrespective of complications, consists in curetting, or, more exactly, in thorough intra-uterine antiseptics. He believes all forms of endometritis amenable to antiseptic treatment, but with variable success. Fungous endometritis is curable quickly and completely; catarrhal endometritis of puerperal origin in the majority of cases, and chronic endometritis, particularly when accompanied by salpingitis, with less certainty. Contra-indications do not exist. Of this he has been convinced, and has taught accordingly for eighteen months. His conviction becomes firmer with enlarging experience. Lymphangitis, salpingitis, ovaritis, and peritonitis may all be benefited by treatment of the accompanying endometritis. In the presence of salpingo-ovaritis, certain surgeons, French as well as foreign, disdain uterine treatment and unhesitatingly extirpate the diseased organs. Trélat believes that cases of salpingitis not extremely painful, and producing a tumor of but medium size, should be submitted to intra-uterine antiseptics and withheld from laparotomy. He maintains also that a certain ratio of these cases recover spontaneously.

The use of the sharp curette is advocated by a large number of authors, amongst whom are Pichevin,¹⁰⁰_{Apr.5} Porak,²⁴_{July 13} Backer,²⁴_{June 29} Batnaud,¹⁴⁸_{Feb.} Para,¹⁰⁰_{Oct.16} Bonilly,²⁴_{Mar.9} Reignier,¹⁰⁰_{Apr.1} Terrillon,¹⁵⁴_{Mar.16; Aug.16} Potherot,⁴⁸_{Mar.} Sobail,²³_{Mar.} Ananoff,¹⁰⁹_{Jan.} Crofford,⁸⁴⁹_{May} Burnett,¹⁹⁸_{July} Alloway,²⁸²_{Dec.'89} Chase,¹_{Mar.8} and Mayo.²¹⁸_{Sept.15} Most of the above hold that curetting is the remedy, *par excellence*, for uterine hæmorrhage having the characteristics of either metror- or menor- rhagia, for muco-purulent uterine discharges, for pain accompanying either one of these discharges, and especially marked during menstruation. The best results are obtained in cases of hæmorrhage, the least satisfactory where there is tubal disease. Nearly all hold that the curetting itself is innocuous provided asepsis be maintained before, during, and after the operation. Accidents result from infection.

The steps of the operation are essentially: disinfection of

the vagina; dilatation by the steel dilator, or, preferably, by antiseptic laminaria tents, using a small one for twenty-four hours, and then a larger one for the same time, with an antiseptic douche between and after; the thorough use of the sharp curette; uterine irrigation to remove all shreds and clots; the introduction of a strip of iodoform gauze into the uterine cavity to insure thorough drainage, or, as advised by Bouilly, an injection of tincture of iodine if the discharge is muco-purulent in character, or application of zinc chloride if hæmorrhagic; introduction of loose vaginal tampon of iodoform gauze; patient to remain quiet in bed several days; ice-bag over supra-pubic region if there is any pain. With these precautions accidents are rare and results very satisfactory.

The necessity for free dilatation and drainage in the treatment of endometritis is recognized and urged by Wylie,²⁷ Jan. Polk,²⁰ Chéron,¹⁴⁸ Aug. 16; Oct. 1 Porak,²⁴ Jan. 19 and others.

Falk³¹⁷ No. 33 has experimented with antrophores, used for some time for the male urethra, modified so that they could be utilized in intra-uterine medication. The vagina and os uteri were first disinfected, and the antrophore introduced by a pair of forceps through a cylindrical speculum without dilating the cervical canal; the instrument was left *in situ* for ten minutes, and then the spiral was removed, the medicament having by this time been thoroughly dissolved. Positive dosage may be had with this instrument. In fungoid endometritis antrophores with zinc chloride (1 per cent.), cupric sulphate (0.3 to 1 per cent.), resorcin (10 per cent.), tannin (5 to 10 per cent.), were found the most efficacious; while in gonorrhœal endometritis sublimate (0.1 per cent.), creasote (2 per cent.), and especially sublimate (0.1 per cent.) with zinc chloride (1 per cent.), were found useful. As zinc chloride, resorcin, and creasote produced uterine colic, the antrophores were coated with a layer of cocaine, with which the procedure was painless.

For the treatment of cases of mild uterine catarrh, Vergely¹ Mar. 22 has found a solution of zinc chloride most satisfactory. The treatment is commenced eight days after the termination of menstruation, and in the absence of any pain in tissues contiguous to the uterus or ovaries. The vagina and cervix uteri are first irrigated with a hot 15-per-cent. solution of boric acid combined with 1-to-200 solution of sublimate. The uterine cavity is then

carefully cleansed of all mucus and a 5-per-cent. solution of the chloride of zinc applied over the entire surface of the mucous membrane. This operation is repeated two or three times at intervals of eight days, and a more concentrated solution of the zinc may be used if indicated. The application is rarely painful, excepting in cases in which there is much congestion or inflammation. In the latter case the zinc may excite bleeding, which may continue moderately for several hours. Should there be fungosities, or should the ulceration not yield promptly to the zinc treatment, one may employ a solution of chromic acid (1 to 3). The latter gives very little pain and produces a yellow slough, which falls off in about six days. It may be well to alternate the chromic acid with the zinc. Great care must be used that these solutions are applied only to the diseased tissues, and after their use the tissues should be again irrigated with the antiseptic solution.

Dumontpallier's zinc pencils, ³_{May 14}, which have given such good results in certain hands, are prepared as follows: Five drachms (20 grammes) of chloride of zinc (dry) are put into a mortar and reduced to powder; water is added, drop by drop, until a consistence of syrup is obtained; then, by degrees, 1 ounce (32 grammes) of rye-flour is added, so that a sort of putty-cake is made, and when perfectly homogeneous the cake is divided into pieces weighing a drachm (4 grammes) each, which, in their turn, are rolled on the pill-board to the length and thickness desirable (about 4 to 6 millimetres). They are then placed in an oven until a certain degree of hardness is obtained, without, however, depriving them of their elasticity. One of these pencils is introduced into the uterine cavity and left there. Slight pain follows, which may necessitate hypodermics of morphia for a short time. Grandmaison ¹⁰⁰_{Aug. 3} claims that this method is a certain cure for chronic endometritis; that if properly used subsequent atresia or stenosis is rare; that menstruation becomes normal six weeks after the treatment, and that subsequent pregnancy is not prevented. Moret, ²⁴_{Feb. 9}, however, though favoring the treatment, states that the uterus must be kept dilated by the passage of bougies, from No. 15 to No. 21, for some time, to prevent contraction of the uterine canal and subsequent dysmenorrhœa. Schrader ³¹⁷_{Apr. 12} condemns cauterization of the endometrium by caustic agents

because of the danger of decomposition of the eschar and septic infection. This remark applies particularly to the use of iron solutions.

Stratz,³⁹³_{B.18,II.2} who has made careful trials of the zinc chloride in the treatment of cervical endometritis, finds that the strong solutions give fair results, but that the only sure method of cure is the excision of the cervical mucosa by Schrader's method.

Duke, of Dublin, collaborator, recommends powdered boric acid as of especial value in the treatment of chronic endometritis. This is applied in bulk to the endometrium by a syringe-like carrier.

DISEASES OF THE CERVIX.

Lacerations.—T. A. Emmet³⁹_{Aug.1} in a recent paper states that, as the result of twenty-eight years of observation and close study of the subject, he now believes that trachelorrhaphy should be employed only for the relief of certain reflex symptoms accompanied by more or less impaired nutrition, and to guard against the occurrence of epithelioma. In the future the profession can do much to lessen the need of surgical interference, for many of these tears will heal if kept clean and free from sepsis after labor. He recommends at first frequent hot douches and saline laxatives; later, iodine, careful tamponade, and attention to the general health. Skene Keith²²_{Oct.22} and others lay stress on this same point, that it is the severity of the symptoms and not the depth of the tear that may call for operation. Bullock²²⁴_{Dec.21,99} favors early operation. Boyd²⁰²_{Aug.25} notes very favorable results from the use of strong galvanism. Alloway,²⁸²_{Jan.} from a study of the influence of cervical amputation on future parturition, finds that it favors impregnation, makes labor more easy, lessens risk of injury to cervix, and does not increase the chances of premature labor or abortion. A. Littauer¹³_{Apr.} gives a very complete list of the literature of cervical tears and Emmet's operation.

Hæmatoma.—E. J. Kempf⁹_{Apr.5} notes a case of hæmatoma of the posterior cervical lip, which appeared during a severe instrumental labor. The blood-tumor was about the size of the placenta, protruded some 5 inches from the vulva, began to slough, and was amputated by a double ligature twenty-four hours after delivery. Convalescence normal.

Syphilis.—Razūmoff⁵⁸⁶_{No.10} regards chancre and chancroid of the

cervix as not particularly rare. He has found cervical chaneroid in 7.44 per cent. of disease found in all regions of the body in prostitutes and chanere in 1 per cent. In working-women the percentages were respectively 2.32 and 1 per cent. He notes, further, that cervical chaneroid is but rarely associated with inguinal buboes, while with chanere polyadenitis is usual. Martineau's assertion that cervical chanere is often followed by retro-uterine lymphangitis and lymphadenitis with local peritonitis is not supported by clinical evidence.

UTERINE DISPLACEMENT.

General Considerations.—Noble¹¹⁷_{Apr.} believes that relaxation and stretching of the utero-sacral ligaments from the weight of a congested or subinvolted uterus is a most potent cause of uterine displacement. Runnels⁷²_{Jan.} thinks the various forms of pelvic inflammation are to blame, and finds his best results from a persistent boro-glyceride tamponade. Martin⁹_{Feb.22} calls renewed attention to the value of the systematic employment of the knee-chest position, particularly in retroversions.

The usual histories of long-neglected pessaries are told by Bates,⁸²_{July 5} Wilson,¹⁰⁴_{Jan.11} Gervis,²²_{Mar.26} Godson,²²_{Mar.26} and Jackson.¹³⁷_{Mar.} The latter notes 9 cases by various authors, and his own, where pessaries of the most varied materials—tow, wood, glass, sponge, gold, rubber—had lain undisturbed in the vagina for periods of from nine and a half to forty-one years, which, we believe, is the longest time on record. All of these pessaries were coated with a whitish, calcareous matter, which had caused more or less vaginal ulceration. These cases emphasize the necessity of always telling patients who are wearing pessaries that the pessaries must be removed at intervals and cleansed.

Very good papers favoring the use of pessaries, when carefully, intelligently, and scientifically employed, have been written by Jakins²⁶⁷_{Mar.} and J. R. Haynes.⁴⁴_{Feb.}

Anteflexion.—The characteristic feature of pathological anteflexion is simply the stability of the flexion. The causes of this stability are either in the uterus itself or influence it from without. According to Harrison,¹_{Oct.4} metritis or infarction belong to the first class of causes, while parametritis posterior, chronic atrophic parametritis, and perimetritis belong to the second and more frequent set of causes. The symptoms usually associated with anteflexion

are dysmenorrhœa and sterility. The dysmenorrhœa is not mechanical, but due to the associated metritis. The sterility is attributable to the accompanying endometritis, oöphoritis, and perimetritis. If these troubles are removed conception may ensue, in spite of permanent antelexion. In the treatment, scarification is recommended just before menstruation where the uterus is sensitive, together with dilatation and treatment of the complicating conditions. Harrison also notes good results from an ichthyol ointment applied about the fornix in clearing up old adhesions. Rapid dilation is advocated by Mulheron and the wearing of a spiral-wire elastic-stem pessary by Reeves Jackson.⁷⁷⁹

Retroversions and Flexions.—Johnson⁷⁸⁶ records several cases of acute retrodisplacement in which it was impossible to replace the uterus, even with the patient in the knee-chest position, but where success was finally achieved by the colpeurynter in the rectum.

Byford⁶¹ suggests holding the retroverted uterus forward by vaginal tampons after removal of the appendages, so that adhesions may form between the stumps and the adjacent peritoneum, and notes 4 cases where the manœuvre was successful.

Schultze's method of bimanual separation of the adherent retroverted uterus is strongly advocated by Smith²² in properly selected cases, *i.e.*, where the adhesions are fine, band-like, or cordiform, and where we can exclude tumors or distended or adherent tubes. The patient must be thoroughly examined under an anæsthetic, and the adhesions accurately mapped out before any attempt is made at forcible separation. This precaution cannot be too strongly insisted upon. Unless you can define precisely the nature and extent of the adhesions and exclude the possibility of infected tubes, the method is not to be tried.

Frommel³¹⁷ recommends, after the uterus has been freed and drawn well forward, the shortening of the utero-sacral ligaments by transfixing each near its attachment to the uterus and suturing it to the peritoneum covering the lateral wall of the pelvis. We should think that in practice this little procedure would prove not only difficult, but more risky than other equally effective measures.

In spite of the many and severe criticisms of the vaginal suture of the retroflexed uterus devised by Schüeking,³¹⁷ ⁵ Feb. 22; Nov. has

been done, that author states, in 62 cases, without a failure in the last 43. He calls attention to the following points regarding the technique: The ligatures should be left *in situ* for eight or ten weeks. A pessary must be introduced at once. If the urine is bloody, showing that the bladder has been wounded, the organ should be irrigated with a solution of thymol, and a pencil of iodoform or salol should be inserted into it. The uterus should be drawn down slowly and steadily, until the operator satisfies himself that the needle can be passed beneath the right pubic bone. The point of the needle must be protruded at the fundus, and not lower down on the anterior uterine wall. To avoid cutting through the anterior lip of the cervix with the ligature, the latter may be passed through a round button, or it may be carried directly through the substance of the lip. It should be noted that the suture does not pass behind but close beside the bladder. There are no contra-indications to this operation. It is only necessary to free the adhesions first according to Schultze's method.

Favorable reports of Alexander's operation for shortening the round ligaments have been made by Carpenter,⁶¹ Schwartz,⁶¹ Alloway²⁸²_{Apr.} (who advises the wearing of a double truss for a few months), Fry,⁸¹_{June} Terrillon,³_{Mar.12} Braham,²⁷_{Nov.} and Edebohls¹_{Oct.11} (who operates by laying the inguinal canal open along its entire length, picking up the ligament at its point of emergence from the internal ring). Alexander⁶_{Aug.2} submits the following propositions regarding the reciprocal effects of pregnancy and parturition upon the operation: 1. That pregnancy is promoted in cases of retroflexion and retroversion of the uterus by this operation, and that it proceeds and terminates, as a general rule, in a normal way. 2. That, in cases where the round ligaments have been shortened for backward displacements, the displacement does not usually tend to recur after subsequent pregnancies; whilst in cases where the round ligaments have been shortened for procidentia or prolapse, the return of the downward displacement will depend on the amount of destruction of the perineum during the passage of the child. The anatomical and physiological considerations that favor the truth of these propositions are considered. It is shown that the round ligaments are not required to stretch so much during pregnancy as is generally believed; that the uterus, in its ascent

into the abdomen, accommodates its development to the length of the round ligaments; and that involution retraces the steps of evolution. Alexander reports 7 cases. All were delivered without any inconvenience. In 4 the after-effects were, as far as known, satisfactory; in the fifth the perineum was ruptured during delivery, and, as it was not sutured, the uterus was being dragged down when he first saw the case afterward.

Hysteropexy, or ventral fixation of the uterus, has been regarded with more or less favor by Boldt,²⁷ Baudoin,¹⁵² Faucon,⁵² Debayle,³⁴⁵ Bianu,²⁵⁹ Gross,¹⁸⁴ Delétrez,²⁴ Lakhnitzky,⁵⁸⁶ and Eastman.⁵⁶ Leopold,⁴⁰⁴ after narrating the histories of 6 cases, concludes that the operation is still far from the ideal one. It is only indicated during the performance of oöphorectomy and salpingectomy, or during the removal of growths which hold the uterus in a permanently retroverted condition, and, rarely, in pure retroflexion of the mobile, non-adherent uterus, where the suffering of the patient can be traced to no other cause, and other forms of treatment have been resorted to without avail.

The operation should be simple and trustworthy. The most important preparatory work consists in sundering the uterine adhesions, which, though often sparse and thin, are now and then very numerous and of cartilaginous consistence; the frailer ones may be best separated by the index finger. Bleeding seldom follows; should it occur and continue, the part may be tamponed with a roll of iodoform gauze, which may remain in position till the close of the operation. When the adhesions are numerous and firm, the greatest caution is necessary; force should not be employed; what the fingers cannot separate should be cut with a knife or scissors. The sutures are so made that from one to three deep abdominal sutures pass through the fundus uteri and draw it to the abdominal wall. The first enters about $\frac{1}{2}$ to 1 centimetre anterior to the tubal opening; the second between it and the third, $\frac{1}{2}$ to 1 centimetre behind it, going transversely under the serous coat of the uterus, and about 2 to 3 millimetres deep through the muscular layer. The three sutures should be long, so as to be differentiated later on. The abdominal sutures are removed from eight to twelve days later, the three fixing the uterus remaining until the fourteenth or eighteenth day; by this time the fundus is firmly adherent to the abdominal wall. In order to render the adhesion more

certain, the serous surface of the uterus is abraded at the point of apposition to the abdominal wall.

Pozzi²_{Sept.20} and Laroyenne⁷³_{July} recommend a similar procedure. Kelly²⁷_{July} has attempted to perform hysteropexy by stitching the retroflexed uterus to the abdominal wall without opening the abdomen; but though the cases were carefully selected, and the mechanical portion of the operation as perfect as could be desired, the ultimate results were not favorable. Assaky²⁵⁹_{Aug.16} and Roux³_{Dec.11} report similar results. A. P. Dudley²⁷_{Dec.} performs a modified operation by denuding an oval area on the anterior uterine wall and contiguous surfaces on the inner side of each round ligament. These denuded surfaces are then sewed together with a continuous catgut suture, so as to shorten the round ligament and thus hold the uterus forward.

Prolapsus.—Hirst¹¹²_{Feb.} notes the case of a nulliparous girl of 14 who had complete prolapse of the uterus, which began after lifting a heavy weight at 11, since which time also the girl had led the life of a prostitute. She had been accustomed to keep the uterus in place with large wads of newspaper. Anterior and posterior colporrhaphy were performed and resulted in a cure. Will,¹¹⁵_{Dec.,'89} in a good paper on the treatment of prolapsus, reports most excellent results from astringent tamponade, the lateral abdominal position, and strychnia injections into the vaginal tissues. Cushing²³_{July} records a case cured by high amputation of cervix, with attachment of stump to vaginal wall by Martin's method. Coe,²⁷_{Jan.} in a case of incurable prolapsus, performed vaginal hysterectomy with resection of the redundant vagina; the operation was difficult, but resulted in cure.

Ventro-fixation for prolapsus is held to be suitable only in extreme cases, and then only as an adjunct to other surgical measures, as colporrhaphy, etc. It is discussed, with other forms of treatment, by Demoret,¹⁰⁰_{Nov.30,'89} Chaput,³_{Jan.8} Vaton,⁷⁰_{Jan.12} Ozenne,¹⁴_{Jan.8} Baudoin,²¹¹_{Aug.10} Engström,⁴⁹⁸_{Mar.} and others. The technique of the operation is similar to that of ventro-fixation for backward displacements.

The treatment of prolapsus by massage (Brandt's method) has received attention and a moderate amount of commendation from many writers, among whom are Schaeffer¹¹⁶_{Sept.} (who gives also the literature), Fredericq,²⁹³_{Apr.} Fellner,⁵⁷_{Nov.17,'39} Doederlein,²⁷_{Sept.} Sprague,¹⁰⁶²_{Sept.} Vulliet,²³_{July, Aug.} Schurig,¹²³_{Nov.16} Ziegenspeck,⁴⁰⁴_{Jan.} Müller,³⁴_{May 6} Hattzappel,⁶⁵⁰_{Oct.2}

Philippeau, ¹⁵⁴_{Jan.1} Loghothetis, ²³²_{Jan.31} Goldspiegel, ²³⁶_{Nov.} Arendt, ⁴_{Jan.20} Swiecicki, ³⁴_{Jan.7} Berczeller, ³⁵⁷_{Jan.1} Rivière. ²⁹⁰_{Dec.24,'89} Others, foremost among whom is Taylor, ¹_{July 12} condemn the preceding as being not only useless, but practically a method of masturbation. It seems undoubted that the method does possess many and serious ethical objections, which will prevent its ever being generally employed, but it is equally true that in skilled hands it may accomplish great benefit.

Artificial prolapsus for facilitating diagnosis or operation is condemned by Coe. ¹_{Aug.9} The practice is indulged in to a much greater extent abroad than in this country, where it is nearly obsolete. It has undoubtedly done much harm, and when there is disease about the uterus it is dangerous. The tissues are apt to be overstretched, even if in a normal condition, and this risk is greater if they are already relaxed. Rupture of diseased tubes or ovaries may occur, or peri-oöphoritis from the dragging on the broad ligaments. A skilled operator should not find it necessary to pull down the uterus, but should merely steady it, for any manipulation.

FIBROMATA.

General Considerations.—Opinions regarding the pathogenesis and etiology of uterine myomata are still very diverse. Roesger ³⁹³_{B.33; H.1} agrees with Kleinwächter that these tumors are identical with embryonic uterine tissue, and that this tissue is normally and pathologically developed from the muscular coats of its arteries. Even as late as the eighth month the uterine tissue is very similar to myomatous. Engström ²⁷_{Oct.} believes that uterine myomata are products of congestion, and stand in relation with menstruate and sexual activity. He believes also in a certain heredity. Fehling ³¹⁷_{July 19} contends that, contrary to prevailing opinion, myomata are more common in unmarried than in married women. They are the product of some irritation of the uterine tissue. Eastman ⁵⁶_{Apr.} believes that diseased ovaries and tubes stand in positive and important causative relation to fibroid tumors; and, supporting this, Popoff, ¹⁰⁰⁹_{No.55} in 20 cases where the ovaries were removed for fibromata, has found them invariably diseased, there being a hyperplasia of the connective tissue, with a corresponding enlargement of the organ. The cortex was principally affected. Popoff, however, considers that the morbid changes in the ovaries are induced by the congestion resulting from the presence of the

fibroid, and that they, with the congestive change in the mucosa of the Fallopian tube, are the causes of the usual sterility in women suffering from these growths.

Spontaneous Inversion Caused by Submucous Fibroids.—Cases have been noted by Cullingworth,⁶ Dodge,²⁷ and Le Bec¹⁵² Aug. 15; all recovered after removal of the tumor, or hysterectomy.

Medical Treatment.—But little can be said in favor of medicinal remedial agents. Leopold⁹⁵ B. 38, H. 1 considers the treatment by the subcutaneous injection of ergotinine or ergotine tedious and unsatisfactory. The prognosis for subsequent operative treatment is also impaired by this treatment, because of the degenerative changes induced in the heart-muscle as well as in the tumor. Cutter²⁷ Oct. speaks favorably of a diet of meat and hot water, according to the Salisbury system.

Electrical Treatment.—(See ANNUAL for 1890.) During the past year the following authors have placed themselves on record as favoring the therapeutic use of galvanism in the palliative treatment of uterine fibroids: Alloway,²⁸² Rutherford, ²⁶ Jan. Massey, ¹⁰⁴ Feb. 22 Rockwell, ⁹ Jan. 25 McMullen, ²⁸⁵ Mar. Rouffart, ²⁷⁶ Mar. 20 Bigelow, ⁹ May 10 Hobart, ⁹⁹ Nov. 28, '89; May Hall, ²⁷ Dec. '89 Massin, ²³⁶ Feb. Goelet, ⁹ Jan. 25 McGinnis, ⁹ Jan. 25 Buckmaster, ⁹ Jan. 25 Smart, ²² May 7 Skene, ³¹ Dec. 28, '89 Martin, ¹ Dec. 28, '89 Hazslinszky, ¹⁴⁷ Aug. Rokitansky, ⁸ Nov. Labadie-Lagrave, ³¹ Oct. 16 Regnier, ³¹ Oct. 16 Le Bec, ¹⁵² Aug. 29 Sprague, ¹⁰⁶² Delé- tang, ⁹³² Apr. Plicque, ¹⁰⁰ Nov. 16, '89 Kötschau, ³⁴ Jan. 21 Hynes, ⁵⁰⁶ July Hyatt, ⁴³ Sept. Ransom, ¹⁰⁵ Sept. 15 Spanton, ²⁶ Sept. F. Engelmann, ⁶⁹ July 3 Greene, ¹¹⁵ Oct. Rohé, ⁷⁶⁰ Nov. 22 Whittington, ⁴³ Oct. Murfrie, ⁶¹ Nov. 15 Gubaroff, ⁶⁹ Oct. 2 Broese, ⁶⁹ Oct. 2 Klein, ³⁹³ B. 19, H. 1 Palmer, ⁴²⁶ Nov. Haines, ⁶¹ Nov. 15 Weller, ⁶ Aug. 30 Cholmogoroff, ³⁹³ B. 17, H. 2 Hyatt, ⁴³ Sept. Sprague, ¹⁰⁶² Graydon, ¹⁴⁹ June Bevill, ⁸⁵ Aug. Smart, ¹⁸⁷ July Mann, ¹⁷⁰ May

Pryor²⁷ Apr. records a case where a patient with a large fibroid was treated every four days for two years by galvanism, receiving from 75 to 150 milliampères at each sitting. The treatment did no good, and, the hæmorrhage increasing, hysterectomy was successfully done. Coe²⁷ Apr. notes a similar case. Baldy⁹ Mar. 22 regards galvanism as a therapeutic agent which will mitigate, but never cure. The relief that he has noted from electricity has been the same as that obtained from glycerin tampons, hot-water injections, purgatives, etc., with the difference that electricity has been slower in its action.

Apostoli²³ Feb. again reiterates that his sole claim for the galvanic treatment is that it will effect a symptomatic cure. Want of success he attributes to inexperience in gynæcology, want of operative

dexterity, and complete ignorance of physical laws on the part of many physicians who try to use the treatment. He²⁰²_{Nov. 25} warns against the careless or unskillful use of the electric current, and particularly against employing it in cases where there are cystic or purulent conditions of the appendages present, and notes cases of death from its use in such conditions. From July, 1882, to July, 1890, Apostoli²_{Aug. 16} has applied electricity 11,499 times to 912 patients, including, besides the fibroids, 133 cases of endometritis alone and 248 of the same affection complicated by pelvic inflammation. Only 3 deaths attributable to the method itself had occurred. Gautier¹⁵⁴_{May 1} ¹⁴⁷_{Nov.} has made 1329 applications in 67 cases, of which 62 have been symptomatically cured, 4 have been unrelieved, and 1 died from unrecognized disease of the appendages. Of the four failures, two were proved by their subsequent course to be cases of malignant disease. The first effects of treatment are to relieve pain and hæmorrhage. The positive pole is hæmostatic and should be used in hæmorrhagic cases. The current intensity should vary with the case. Clinical observation, however, shows it should be made as high as possible without causing severe pain; strong currents hasten both the symptomatic and anatomical cure. Feeble currents used for pain generally fail to produce rapid hæmostasis. Gautier uses currents varying from 30 to 250 milliampères, 126 to 140 being the mean. This treatment restores the strength of the patient and assures a symptomatic cure, while at the same time it diminishes the size of the tumor in a varying but notable degree. This method is neither powerless nor dangerous, and, in the face of hysterectomy, with a mortality of 42.85 to 100, and of castration with a mortality of 13.3 to 100, it becomes of necessity the initial treatment in every fibroid. A grand total of more than 2000 reported cases and more than 30,000 applications demonstrate the innocuousness of the treatment and the rapidity with which it has come into professional favor.

Lucas-Championnière and Danion¹⁸⁴_{Mar. 15} report excellent results from the employment of weak currents of from 45 to 65 milliampères. They invariably begin with the positive pole and repeatedly reverse the current. They have employed from 14 to 26 sittings, and have found an occasional return to treatment necessary.

The action of the constant current upon myomata recently removed from the living subject has been studied by Klein,³⁹³_{B. 19, H. 1} ²⁷_{Oct.}

who finds a chemical action (produced by the formation of acids at the positive and alkalies at the negative pole, accompanied by the copious production of gases), a heating action, and injuries to adjacent arteries, veins, and lymphatics. Microscopically, the tissues showed marked degenerative changes over small areas adjacent to the electrodes.

Skene²⁷_{Oct.} remarks that all the tissues through which the current passes probably sustain a certain degree of electrolysis. The great vitality of the normal tissues enables them to regain their original condition, which the fibroid does not. Electrolysis is what is wanted, not cauterization. Ford²⁷_{Oct.} and others urge the necessity of using currents of volume and low intensity to produce the maximum of electrolytic with the minimum of caustic action. In order to produce these effects, and from practical experience, Mundé²⁷_{June} advocates vaginal puncture under careful antisepsis in certain selected cases.

A fair estimate of the galvanic treatment of fibroids is that it is a usually effective and reliable therapeutic measure for symptomatic relief, and that it should be employed in cases where operation is not advisable, where, with severe symptoms, growth is slow, and in women nearing the menopause.

Forcible Dilatation.—The following propositions regarding the conservative treatment of the ordinary difficulties associated with uterine myomata are given in a paper by Walton²³⁶_{Dec., '99}: 1. With fibromata which completely fill the uterine cavity, rapid dilatation facilitates accurate diagnosis or subsequent operation. 2. Forced dilatation may rupture the capsule of the growth and allow spontaneous enucleation. 3. Forced dilatation with curetting will nearly always arrest hæmorrhage. 4. By facilitating the circulation it may lead to involution of the growth. 5. It often accomplishes a symptomatic cure. 6. By allowing disinfection of the uterine cavity it is an efficient means for relieving the fetid discharge common with these tumors.

Vaginal Enucleation.—The extraction of intra-parietal uterine myomata through the natural passages by means of a preliminary dilatation of the cervix by repeated packings with iodoform gauze or by instrumental means, followed by incision of the capsule of the tumor, and either its immediate removal by morcellement or enucleation or allowing it to be spontaneously expelled after a

time by the contractions of the uterus itself, has been favorably discussed by Terrillon,³ ⁷³ Vaton,⁷⁰ Juillard,¹⁶ Vulliet,¹⁰⁰ Chrobak,⁷³¹ Martin,³⁹³ Nebel.³⁴ Enucleation *per vaginam* should be confined to cases where the fibroma is not of excessive size, is submucous or polypoid, and where the cervix is dilatable. Slow dilatation is usually preferable on account of the greater softening of the uterine tissues; the dilatation may be supplemented by several radial incisions. After dilatation the uterus is drawn down by vulsella forceps and the capsule of the tumor incised, usually by a transverse incision. The enucleation should be accomplished by the fingers, when possible. Powerful traction upon the tumor with a view to lifting it from its bed is to be avoided. Reduction of the size of the growth by morcellement is to be preferred to the use of the obstetric forceps, cephalotribe, or cranioclast. If the adhesion of the tumor to its bed is too firm to admit of enucleation, it may be removed by scissors, knife, or *écraseur*, but such procedures are only to be employed as a last resort. There must be strict antisepsis, uterine drainage by iodoform gauze. Ergotin should be regularly given after the operation. Immediate removal after incision of the capsule is best, in most instances, as a waiting policy subjects the patient to the risk of the tumor's sloughing, with the chance of possibly fatal sepsis.

O. D. Fitzgerald⁶⁶³ ^{Sept.} has devised an ingenious cutting forceps for facilitating the operation of morcellement. His method is, after enucleating the tumor from its capsule as far as expedient, to hold it firmly by a strong ligature or vulsella and to pass the sharp-edged, duck-bill blade of his forceps into the growth by a "pendulum" motion. Then the other fenestrated blade is pushed up under the capsule, the forceps is locked, and by compression a piece is bitten out from the fibroid. Subsequent "bites" are easily taken until the growth is reduced enough to be delivered through the os. He reports several cases successfully operated upon by this method. McMor-die²² ^{Nov. 27, '89} reports 3 cases where large submucous polypi were removed after slitting the cervix. There is, he believes, much less risk of septic infection after moderate dilatation and slitting than after complete dilatation, for the reason that the latter is always accompanied by some laceration which is more likely to become the medium of septic infection than a clean-cut surface. Other cases of vaginal enucleation are reported by Guéniot,²⁴ ^{Jan. 5} Chumm,¹⁰⁴ ^{Dec. 28, '89} and Sinclair.⁹⁰ ^{Jan.}

The *mortality* after vaginal enucleation by experienced operators is now about 5 per cent., Leopold ⁹⁵_{B.38, II.1} having done 28 and Chrobak 19, each with 1 death. The prognosis after enucleation of *sloughing* fibroids is much graver, only 3 out of 5 cases reported during the past year having recovered.

Vaginal Hysterectomy.—Cases of small *multiple* fibromata which require operation and in which enucleation is not practicable may necessitate this operation. Leopold ⁹⁵_{B.38, II.1} reports 21 cases with 3 deaths; Frank 10, all of which recovered; and Martel ⁵⁵_{Sept.13} and Laroyenne ²¹¹_{Nov.8} each 1 successful case. (See also “Vaginal Hysterectomy for Cancer.”)

Oöphorectomy.—Tait ²_{Nov.1} speaks very strongly in favor of this method of treatment. Of 327 consecutive cases, where he removed the appendages, there was a mortality of only 6 (1.8 per cent.). There were 5 failures, while 90 per cent. were completely relieved. Wiedow ³¹⁷_{Feb.15} reports 66 cases with 5 deaths. In 21 the menopause was established at once; in 15 after a short time. The tumor disappeared in 24, in 8 grew smaller, and in 1 was not influenced. Leopold ⁹⁵_{B.38, II.1} has done 35 operations with 4 deaths. Fifteen cases in all, with 1 death, have been recorded by Humphrey, ²⁶⁷_{Sept.} Rabagliati, ²²_{Oct.8} Kelly and Robb, ⁷⁶⁴_{Jan.} Rohmer, ¹⁸⁴_{July 15} Edebohls, ¹⁵⁰_{May} Faucon, ²²⁰_{Nov.29, '89} Graff, ¹⁰⁵_{May 1} McMurtry, ¹⁹⁸_{June} and Mulheron, ³³⁹_{June}. I have found, in looking back over the literature, notes of 1187 cases with 76 deaths, a mortality of only 6.4 per cent. With this mortality, and with the favorable results recorded, oöphorectomy should always be the operation of election in cases requiring laparotomy, and in which the ovaries can be reached. This latter proviso becomes important when we find that in about 18 per cent. one or both ovaries cannot be reached. The operation is also not suitable for pediculated or very large tumors or for fibro-cysts.

Supra-Vaginal Hysterectomy and Myomectomy.—These methods become necessary for the removal of large interstitial or subserous tumors, with severe symptoms, or in the cases of smaller growths, where electricity, vaginal enucleation, or removal of the appendages cannot be employed or do not cure. About 10 per cent. of all cases come under this head. Enucleation is to be preferred, where it can be performed, so as to leave the woman functionally intact ovaries, tubes, and uterus; otherwise it has no important advantage over hysterectomy, and leaves the woman

LAPAROTOMY FOR FIBROIDS.

WHERE REPORTED.	OPERATOR.	CASES.	NATURE OF GROWTH.	OPERATION.	PERICLS.	RESULT.
Can. Pract., September 1, 1891.	A. B. Aberton.	1	Fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
British Gyn. Journal, February.	G. Bantock.	4	Fibroma.	Enucleation.	Extraperit.	Recovered.
British Gyn. Journal, May.	G. Bantock.	4	Fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
Oest.-Eng. Cent. J. Med. Wiss., July 3.	Egan v. Braun.	58	Fibroma.	Sup.-vag. hyst. and myomet.	Extraperit.	Recovered.
Amer. Journal of Obstetrics, September.	B. T. Byford.	1	Fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
Amer. Journal of Obstetrics, February.	Bull.	1	Fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
Dublin Journal Med. Sciences, May.	St. Clair Boyd.	1	Fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
La Semaine Med., May 7.	Bouilly.	1	Fib. cyst.	Enucleation.	Extraperit.	Recovered.
Edinburgh Medical Jour., July.	N. T. Brewis.	1	Fib. with double ooph. salpingitis.	Sup.-vag. hyst.	Extraperit.	Recovered.
La Semaine Med., June 1.	Ganchoux.	2	Fibroma.	Sup.-vag. hyst.	Dropped.	3 recovered, 1 died.
Amer. Journal of Obstetrics, July.	Chen.	6	Fibroma, pyosalpinx.	Sup.-vag. hyst.	Dropped.	Recovered.
Amer. Journal of Obstetrics, June.	Chen.	1	Fib. cyst.	Sup.-vag. hyst.	Extraperit.	Recovered.
Annals of Gyn. and Ped., March.	E. W. Cushing.	1	Fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
N. Y. Medical Journal, July 19.	Richard Douglas.	1	Fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
J. Sci. Med. Lille, August 15.	Duret.	3	Fib. cyst.	Sup.-vag. hyst.	Extraperit.	Recovered.
Northwestern Lancet, September 15.	F. A. Dunsmore.	1	Fibroma.	Sup.-vag. hyst.	Dropped.	Recovered.
Jour. de Med. de Paris, October 19.	Delcroix.	2	Fib. cyst.	Sup.-vag. hyst.	Extraperit.	Recovered.
Jour. de Med. de Paris, September 14.	Delcroix.	1	Fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
Indian Med. Jour., April.	Jos. Eastman.	10	Fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
Med. Moniteur, May.	Edenhofer.	3	Fibroma.	Hyst., myomet., and ooph.	Extraperit.	Recovered.
Wien. Klin. Woch., December 12.	Edenhofer.	1	Fibroma.	Myometomy.	Extraperit.	Recovered.
Amer. Jour. of Obstet., March, April.	Feole.	3	Fibroma.	Hyst., myomet., and ooph.	Extraperit.	Recovered.
Bert. Gyn. Journal, August.	Feole.	4	Myofibroma.	Hyst., myomet., and ooph.	Extraperit.	Recovered.
N. Y. Med. Rec., February 22.	Vol Graham.	1	Fibromata.	Sup.-vag. hyst.*	Extraperit.	Recovered.
Gyn. Med. Review, February.	W. Graham.	2	Fibromata.	Enucleation.	Dropped.	Recovered.
Amer. Jour. of Obstet., March.	Vol Graham.	2	Fibromata.	Enucleation.	Dropped.	Recovered.
Bert. Med. Journal, December 21.	Galsani.	1	Fibromata.	Sup.-vag. hyst.	Extraperit.	Recovered.
Amer. Jour. of Obstetrics, June.	Helmet.	9	Fibroma.	Sup.-vag. enucleation.	Extraperit.	Recovered.
British Med. Journal, March 22.	Hartley.	1	Fibroma.	Sup.-vag. enucleation.	Extraperit.	Recovered.
Boston Med. and Surg. Journal, April 3.	Hartley.	1	Mult. fibroma.	Sup.-vag. enucleation.	Extraperit.	Recovered.
Ann. of Gyn. and Pediatrics.	Hirsch.	1	Super. fibroma.	Enucleation.	Dropped.	Recovered.
Atlanta Medical and Surgical Jour., Nov.	Harlan.	16	Fib. myoma.	Enucleation.	Dropped.	Recovered.
Am. Jour. of Obstet., June 26.	Johnston.	3	Fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
Johns Hopkins Hosp. Bulletin.	Kelly and Robb.	3	Fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
Amer. Jour. of Obstetrics, August.	Krue.	1	Fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
Correspond. f. Schweiz. Aerzt., July.	Koerber.	3	Fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
Gaz. Med. de Paris, July 15.	Langhans.	1	Fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
Leon Med., July 6.	Laroyenne.	1	Fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
Med. Pract., June 1.	J. M. Leff.	1	Fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
Am. Jour. of Obstet., January 18.	J. M. Leff.	1	Fib. cyst.	Sup.-vag. hyst.	Extraperit.	Recovered.
Munch. Med. Woch., April 22.	Merkel.	1	Fib. cyst.	Sup.-vag. hyst.	Extraperit.	Recovered.
Ann. of Gyn. and Ped., January.	E. E. Montgomery.	2	Fib. and ovarian cyst.	Sup.-vag. hyst.	Extraperit.	Recovered.
Weekly Medical Review, July 1.	Merriman.	1	Pel. fibroma.	Myometomy.	Extraperit.	Recovered.
Amer. Jour. of Obstetrics, June.	O'Callahan.	3	Fibroma.	Myometomy.	Dropped.	Recovered.
Bert. Gyn. Journal, August.	Vol. O'Callahan.	1	Fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
Jour. de Med. de Paris, January 3.	Vol. O'Callahan.	1	Fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
Jour. de Med. de Paris, Aug. 13.	Schwarz.	1	Pel. fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
Bull. Soc. Anat. Paris, October.	Second.	1	Fibroma.	Myometomy.	Dropped.	Recovered.
Med. Press and Circ., October 22.	R. T. Smith.	1	Fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
Provincial Med. Jour., January 1.	Tait.	1	Fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
Medical Press and Circular, October 8.	Tait.	59	Fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
Sci.-Res. Med. Jour., November 22.	W. Taylor.	1	Fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
Am. Jour. of Obstet., June 25.	Tennison.	40	Fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
Canada Med. Rec., February.	Tennison.	9	Fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
Amer. Journal of Obstetrics, November.	W. O. Weston.	1	Fibroma.	Sup.-vag. hyst.	Extraperit.	Recovered.
Va. Med. Monthly, May.	W. E. Whitman.	1	Fib. cyst.	Sup.-vag. hyst.	Extraperit.	Recovered.
Ann. de Soc. Med. Chir. Liege, April.	Whitwater.	1	Fib. cyst.	Sup.-vag. hyst.	Extraperit.	Recovered.

Grand total, 53 operations, 295 cases, 61 deaths; mortality, 21 per cent. * Difficult operation; pel. lig. passed under middle of vag. † Pel. covered with perit. and dropped; cervix dilated to allow drainage. ‡ Vaginal wound tightly plugged with gauze, as in V. H. † Developed in broad lig.; enucleated.

subject to the risk of fresh myomatous development from small interstitial growth. The *mortality* of abdominal removal has decreased from 33 per cent. five years ago to about 10 per cent. (Irish⁹⁹_{Sept.25}) at the present time, in the hands of certain experts. Thus, Bantock, in about 100 cases, has lost 10; Frank¹_{Mar.22} has done 25, with no death; Fritsch,²⁷_{Oct} out of 87 has lost 8; Leopold⁹⁵_{R.33,H.1} has done 56 with 12 deaths, and gives a summary of 657 operated upon by Germans, with 147 deaths,—a mortality of 22 per cent. Leopold's paper is thorough, practical, and discusses the whole subject of myomata. The main point at issue is still the disposal of the pedicle. Leopold and Fehling³¹⁷_{July.19} favor the extra-peritoneal treatment of the stump and the use of the elastic ligature, Fehling seeking to hasten recovery by cutting off the stump *close* below the ligature between the fourteenth and twenty-first days. Kelly²⁷_{Oct} considers the sloughing of the stump an unsurgical procedure, avoids it by suturing the stump with buried and superficial sutures, and suspending it in the lower angle of the abdominal wound. The ends of the sutures, left long, pass out through the dressing and insure control of the stump in case of any accident. He has used this method in 9 cases, with but 1 death. Richelet²⁶_{Nov.} favors the elastic ligature, with a dropped pedicle. The pedicle should be formed low down so as to show on its surface the mucosa of the cervical canal, which must be thoroughly cauterized with the Paquelin point down to the level of the ligature, Boisseux²⁷_{Oct} having shown that in many cases this mucosa contains toxic micro-organisms. Polk,²⁷_{Jan.} after enucleation leaving a sac, stitched the edges to the lower part of the abdominal incision and packed the cavity loosely with iodoform gauze,—a method very generally used with the best results. Marcy,¹_{June.21} in similar cases, would quilt the base beneath the cyst attachment with a continuous tendon suture in double stitch, a long, curved needle, with eye near the point, being used. This suture controls hæmorrhage perfectly, but does not constrict so as to interfere with nutrition. The superfluous edges of the sac are then cut away an inch from the line of suture, infolded, and another line of continuous suture made parallel to and closing the cut edges. This method will be successful with an aseptic suture, aseptically applied, in an aseptic wound. Goffe²⁷_{Apr.} divides the broad ligaments between strong clamp-forceps; applies an elastic ligature low down on the

cervix; amputates, including uterus and appendages; ligates the longer arteries separately; sews down the edge of the broad ligament of one side with a continuous catgut suture, then over the stump-forming flaps, which are firmly sewed; then up the other broad ligament to its free border; so that all there is to be seen in the bottom of the pelvis is smooth peritoneum, with a line of suture running from side to side. The cervix is to be dilated from the vagina about the fifth day to allow drainage. Slough and ligature come away in about two weeks. H. T. Byford¹¹⁵_{Feb.} presents a method of vaginal fixation which has given excellent results in cases with small pedicles. The steps are as follow: Ligate the broad ligaments; separate the bladder from the cervix; put on a temporary elastic ligature below the tumor; transfix and cut off the mass above; ligate the stump in several parts with silk; remove the elastic ligature; perforate anterior vaginal wall in front of the cervix; turn the stump forward into the vagina and clamp it firmly there; sew the peritoneal edge, that was separated along with the bladder from the anterior surface of the uterus, to the posterior surface of the stump, so as to close off the peritoneal cavity from the vagina; close the ventral incision, with or without toilet and drainage, as in other cases. A small piece of iodoform gauze stuffed from below into the rent in the anterior vaginal wall, and left for twenty-four to thirty-six hours, might be useful in preventing any possible accumulation of discharge at that point. The time occupied in separating the bladder and the anterior vaginal wall from the cervix and putting on the clamp-forceps should not be greater than for adjustment of the stump in ventral fixation.

Krönlein¹⁶⁹_{July} has reported the first case noted in literature in which normal pregnancy and labor occurred after extensive resection of the uterus for a large sessile subperitoneal myoma of the fundus.

Intra-capsular sloughing has been employed by G. R. Fowler¹_{June 7} in 4 cases with complete success and no sepsis. He discovered the method accidentally in the first instance, where persistent hæmorrhage from the surface of a large adherent tumor was checked by the actual cautery. The abdominal wound was left open and the process of sloughing, initiated by the cautery, did not cease until complete intra-capsular separation and extrusion had taken place, the process being completed and the wound healed in

six weeks. The risk of sepsis in a procedure like this must be so great as to make it unjustifiable save in the rarest instances, and we sincerely hope that Fowler's good fortune in his 4 cases will not lead other and less experienced men to imitate his essentially unsurgical procedure.

CARCINOMA AND SARCOMA.

Inoculation Experiments.—Experiments on the inoculation of carcinoma and sarcoma have been tried with negative results by Tilanus.⁵⁸³ His method was to introduce small bits of the tissue into the peritoneal cavity of white rats. These became connected with the mesentery by slender bands, and after several months were always found to have lost the characteristics of malignant tissue, the rats remaining in good health. Secondary inoculations from these rats to others were also negative.

Carcinoma.—Spanton⁴⁹ records 2 cases where a malignant growth had developed from the site of a previously healed specific ulcer of the cervix. There was no doubt about the syphilitic nature of the primary ulceration which had disappeared under antisyphilitic treatment several months before the cancer developed. Inglis Parsons and Fenwick⁴⁹ had also noted several similar cases.

Laidley⁶⁵ reports a case corroborated by a post-mortem and microscopical examination of the occurrence of carcinoma of the internal genitals of a girl of only $2\frac{1}{2}$ years of age.

The condition of the uterine mucosa in carcinoma of the cervix has been studied by Grammatikati,¹⁵⁴ who in 3 cases found only endometritis, but in a fourth modification that he considered the beginning of cancerous degeneration. He believes that endometritis occurring with cervical carcinoma must be regarded as a serious complication in the estimation of the ultimate prognosis. Saurenhaus,³⁹³ who has examined 50 uteri removed for disease of the cervix, concludes that the constant changes found in the endometrium of these cases differ in no way from the modifications which occur in every case of simple endometritis, and give no reason for suspecting sarcomatous degeneration. These conclusions are practically identical with those long held by Rüge.

Primary carcinoma of the corporeal endometrium has been observed by Coe¹⁰⁰² in several recent cases. The most important early symptom is the occurrence of hæmorrhages of an irregular

type, perhaps merely a spotting after exertion, with sometimes a reddish, watery, intermenstrual discharge. This occurring at or after the menopause should always be considered suspicious and makes imperative a careful examination. The conditions most frequently mistaken for malignant disease of the endometrium are fungoid endometritis and submucous fibroid. The curette and microscope will usually settle the matter. Practically, it is safe to regard as histologically malignant an adenoma which infiltrates the submucous muscular layer, and in sections of which we find, besides the usual glands, nests of epithelial cells showing a well-marked alveolar arrangement.

Sarcoma.—Kleinschmidt⁹⁵_{B.39,H.1} reports a case of primary sarcoma of the cervix, and finds that there are only 9 other cases of this rare condition reported.

Treatment of Malignant Disease—Medical.—Very little has been said on the medical treatment of malignant disease. Bantock⁴⁹_{May} and Rasch consider Chian turpentine useless, while Inglis Parsons,⁴⁹_{May} Spencer Wells, and Aikman have obtained good palliative results from it in some cases. Listerine has been recommended²⁷¹_{Sept.} as a very efficient and pleasant agent for preventing the offensive smell of the secretions from uterine cancer. Used as a vaginal douche, in the strength of 1 part to 4 of water, it is deodorant, disinfectant, and soothing.

Electricity.—Wernitz⁴_{Sept.22} has employed the strong galvanic current in 4 cases of uterine carcinoma with favorable results. He obtained complete cessation of pain, with resulting sound sleep and good appetite. Hæmorrhage was lessened and all discharges reduced in quantity. The general condition was markedly improved. Gubaroff²⁷_{Oct.} has employed in similar cases currents up to 1000 milliamperes with no ill effects and the same beneficial results. The benefit is ascribed solely to the chemical and electrolytic action of the current.

High Amputation of the Cervix.—Hewett,¹⁰¹_{May} Herzfeld,⁵_{Dec.} Temple,³⁹_{Aug.} Robertson,⁷⁷_{Jan.} Holmes,³⁹_{Aug.} and Fruitnight²⁷_{Mar.} each report cases of high amputation with recovery from the operation. More Madden¹²¹_{July.} writes strongly in favor of the procedure. Dunning⁷⁶⁰_{June 21} urges that, as the primary mortality is less and the subsequent results equally good, it should be the chosen treatment where all of the growth can be removed. Jessett⁴⁹_{May} favors the high amputation

with scissors where the diseased portion can be entirely removed; otherwise, vaginal hysterectomy. Reeves Jackson¹¹⁵_{Feb.} has performed high amputation in 30 cases, with an immediate mortality of 6.6 per cent., 9 being free from recurrence for more than two and a half years. He is in favor of destruction of the diseased tissue by the careful use of the actual cautery, would advise high amputation in selected cases where it is probable that all of the growth can be removed, and considers vaginal hysterectomy unjustifiable and a "ghastly failure." Petrow,³⁵¹_{June} from a study of over 1000 cases of vaginal hysterectomy and high amputation, finds the immediate mortality from the latter 8.7 per cent., it being 10 per cent. less than that of vaginal hysterectomy. Nevertheless, he argues, from the proportion of recurrences, in favor of the total extirpation.

Vaginal Hysterectomy.—Papers discussing the indications and technique of this operation have been written by Schauta,³⁴_{Aug. 19} John Williams,²⁷_{Sept.} Sinclair,¹⁵_{Dec., '89} Pozzi,²⁷_{Sept.} Olshausen,²⁷_{Sept.} Landau,²⁷_{Sept.} Aug. Martin,²⁷_{Sept.} Kaltenbach,²⁷_{Sept.} Reamy,⁴²⁶_{July} F. H. Martin,⁶¹_{May 24} Macan,⁴⁹_{Mar.} Flaischlen,⁶⁹_{No. 29} Gottschalk,³¹⁷_{June 21} Eastman,⁵⁶_{Apr.} Péan,⁸²⁷_{Aug. 30}; ¹⁴_{Sept. 3} Helmuth,¹_{Oct. 4} and others.

The immediate mortality has now decreased to about 10.5 per cent. as a general average. Certain operators have succeeded in reaching a ratio as low as from 3 to 4 per cent. in cases where the ligature has been used. In the accompanying table the mortality is 6.6, 16.6, 11.5, and 15.4 per cent., respectively, for operations done with the ligature, clamp, ligature and clamp, and where the method is not noted.

The principal points under discussion are: when to operate; whether to employ forceps or ligatures.

Of the first question it may be said that the lines are being drawn more closely, and that operation is not to be done except where there is a distinct probability that all the diseased tissue can be removed. Pawlik,⁵⁷_{Nos. 26, 27, 29}; ⁵_{May} in cases where suspicious induration is found in the parametric tissue after removal of the uterus, endeavors to increase the patient's chance by catheterizing the ureters, and so locating them perfectly, and then boldly excising all suspicious tissues, controlling hæmorrhage by mass ligatures. He notes several cases in which this was done successfully.

The question of the use of the ligature or clamp is an im-

portant one. The first is used almost exclusively in Germany; the second, very generally in France. This, Sinclair naively remarks, is not necessarily a question of science, but of patriotism. In America the majority employ the forceps, there being signs, however, of a reaction in the ligature's favor. The advantage in time claimed for the forceps seems to be more than offset by the added comfort to the patient after the use of ligatures; by the undis-

VAGINAL HYSTERECTOMY FOR CANCER.

WHERE REPORTED.	OPERATOR.	CASES.	METHOD.	IMMEDIATE RESULT.	REMARKS.
Can. Med. Rec., April.....	Alloway.....	1	Lig. and clamp.	Recovered.	
Ann. of Gyn., January.....	Baer.....	1	Ligature.	Recovered.	
Maryland Med. Jour., Jan. 25.....	Baer.....	1	Clamp.	Died.	
Med. Press and Circular, April 9.....	Bantock.....	1	Ligature.	Recovered.	
Lancet, January 18.....	Bishop.....	1	Lig. and clamps.	Recovered.	
South. Pract., March.....	Buist.....	1	.....	Recovered.	
Jour. Amer. Med. Association, March.....	Byford.....	7	.....	6 recovered.	1 died.
Am. Pract. and News, August 16.....	Cartledge.....	1	Clamps.	Recovered.	Death from recurrence.
Am. Pract. and News, Sept. 13.....	Cartledge.....	1	Clamps.	Recovered.	
Am. Pract. and News, August 16.....	Cecil.....	1	.....	Recovered.	Death from recurrence.
Am. Jour. of Obstetrics, January.....	Coe.....	1	Clamps.	Recovered.	
Am. Jour. of Obstetrics, April.....	Coe.....	1	Clamps.	Recovered.	Dif. adeno-papilloma.
Am. Jour. of Obstetrics, April.....	Coe.....	1	Clamps.	Recovered.	Malignant adenoma.
Am. Jour. of Obstetrics, June.....	Coe.....	1	Clamps.	Died.	Sarcoma, mitral and renal
Boston Med. and Surg. Jour., Aug. 28.....	Davenport.....	1	Clamps.	Recovered.	[disease.
Jour. Sci. Méd., Lille, Jan. 17.....	Duret.....	1	Clamps.	Recovered.	
Jour. Sci. Méd., Lille, February 28.....	Duret.....	1	Clamps.	Died.	Several drops of pus found in left br. lig. on section at operation. Peritonitis on third day.
Deut. Med. Ges., June 2.....	Edebohl.....	1	Clamps.	Recovered.	
Indiana Med. Jour., April.....	Eastman.....	13	Clamps.	10 rec., 3 died.	
Am. Jour. Obstetrics, April.....	B. McE. Emmet.....	1	.....	Recovered.	Adenosarcoma.
Wien. klin. Woch., Dec. 12, '89.....	Ehrendorfer.....	4	.....	Recovered.	
Lancet, August 2.....	Favel.....	1	.....	Recovered.	
Deut. Med. Woch., July 24.....	Flaischlen.....	20	.....	17 recovered.	3 deaths from sepsis, 7 died from recurrence, 6 no recur. for 3 yrs.
Jour. Hollandais de Gyn.....	Gehl.....	1	.....	Recovered.	Death 6 years later from [recurrence in colon.
Brit. Med. Jour., October 11.....	Godson.....	1	.....	Recovered.	
Am. Jour. of Obstetrics, May.....	Hanks.....	1	.....	Died.	
Bull. Soc. Anat. Paris, May.....	Honzel.....	1	Clamps.	Recovered.	
Mont. Med. Journal, May.....	Holmes.....	1	Clamps.	Recovered.	
Can. Pract., August.....	Holmes.....	1	Clamps.	Recovered.	
Boston Med. and Surg. Jour., Aug. 28.....	Homans.....	1	Clamps.	Recovered.	Fore. left in place 6 days.
Am. Jour. of Obstetrics, December.....	Jayvin.....	1	Clamps.	Recovered.	
Cent. f. Gyn., February 15.....	Kaltenbach.....	60	Ligatures.	58 recovered.	2 for sarcoma. Out of 33 cases operated more than 1 year, 13 were free from a return. In 19 it had recurred.
Zeit. f. Geh. u. Gyn., xx. 1.....	Keller.....	1	.....	Died.	Sarcoma.
Am. Jour. of Obstetrics, June.....	Krug.....	7	Ligature.	6 recovered.	1 death. No recurrence.
Frauenärztl., June.....	Lebedeff.....	12	.....	10 recovered.	2 deaths. Only 1 free [from rec. 3 years.
Jour. Am. Med. Association, May 24.....	F. H. Martin.....	5	Lig. and clamps.	Recovered.	
Jour. Am. Med. Association, Oct. 18.....	F. H. Martin.....	2	Clamps.	Recovered.	
Med. Prog., June.....	McMurtry.....	1	Clamps.	Recovered.	Sarcoma.
Ocoid. Med. Times, May.....	W. F. McNutt.....	5	Lig. and clamps.	Recovered.	1 case fin. by abd. section.
Ocoid. Med. Times, May.....	McMonagle.....	9	Lig. and clamps.	8 recovered.	1 death.
Gaz. Méd. de Picardie, March.....	Montgouet.....	1	Clamps.	Recovered.	
Medical Bulletin, July.....	Montgomery.....	1	Clamps.	5 recovered.	1 died of tetanus.
Tex. Cour. Rec., May.....	Musick.....	6	Ligatures.	Recovered.	
Brit. Med. Journal, April 12.....	Münchmeyer.....	80	Ligatures.	76 recovered.	4 died. [1 year.
Frauenärztl., June.....	Ott.....	11	Lig. and clamp.	8 recovered.	3 died; 6 recurred within 1 sarcoma of uterine body.
Ann. of Gyn., December, '89.....	Pinkham.....	4	Clamps.....	Recovered.	
Jour. Sci. Méd., Lille, January 10.....	Perignon.....	1	Clamps.....	Recovered.	
Rull. Soc. Anat., Paris, June 13.....	Pozzi.....	1	Clamps.....	Recovered.	Double sup. salp.; ap- [pendages removed.
Northwestern Lancet, June 15.....	Ranssey.....	1	Ligatures.	Recovered.	1 died, effects of lightning shock; 1 of shock; 1 2d week of peritonitis.
Oshk. Med. Review, November 15.....	Reed.....	11	Lig. and clamps.	8 recovered.	Recurrence.
Boston Med. and Surg. Jour., Oct. 30.....	Reynolds.....	1	.....	Recovered.	Gravid 3½ months.
Am. Journal of Obstetrics, September.....	Smith.....	1	Clamps.	Recovered.	1 died. Closed vaginal wound by sutures.
Practitioner, December, '89.....	Sinclair.....	10	Ligatures.	6 recovered.	10 died. Material from Breslau Univ. clinic.
British Med. Jour., November 8.....	Sinclair.....	21	Ligatures.	20 recovered.	Gravid 2½ months.
Arch. f. Gyn., 37-3.....	Tannen.....	103	Lig. and clamps.	93 recovered.	Shock.
Sei-I-Kwai Med. Jour., June.....	Taylor.....	1	Lig. and clamps.	Recovered.	
Amer. Jour. of Obstetrics, January.....	Tuttle.....	1	Clamps.	Recovered.	
Amer. Jour. of Obstetrics, May.....	Wenning.....	1	Clamps.	Died.	
		429		45 deaths.	10.5 per cent. mortality.

turbed condition of the wound, until after granulation has begun ; by the lessened amount of sloughing and lessened danger of sepsis ; by the quicker healing ; by the lessened risk of secondary bleeding or of intestinal adhesions. Coe, ^{Feb., May, June} 27 who draws the lines of indication very closely, employs the ligature rather than the forceps, so that by careful drawing down of the broad ligament stumps into the vaginal wound he may decrease the area over which intestinal lesions might form. He also reports 2 cases of his own and 8 from other sources where laparotomy was done for the relief of the intestinal obstruction after vaginal hysterectomy, with fatal results in all. In all these cases the pathological conditions and the clinical symptoms were almost identical. In each one there was an adhesion of one or more coils of small intestine to the edge of the vaginal wound, with distension and bending of the gut above the point of adhesion, thus obstructing the lumen. Although there was intense congestion of the serous covering of the intestines, in no instance was general peritonitis found at the operation. In all but one case death seemed to be due primarily to exhaustion or, where laparotomy was performed, to the shock of the operation. The symptoms continued to be indefinite until after the fourth day, and the classical symptoms of intestinal obstruction (especially fecal vomiting) appeared when it was too late to profit by them. Certain points are to be noted in this connection, as emphasized by Reichel, as bearing on the differential diagnosis. Ileus is most likely to be mistaken for general peritonitis, especially if there should be general tenderness. But, as Coe noted in his cases, pain is conspicuous by its absence. There is little if any elevation of temperature, the pulse may not be accelerated for several days, and tympanites is not excessive. It may be unsymmetrical, being more marked on one side ; this Coe regards as an important sign, when taken in connection with the visible movements of the distended gut. The absence of flatus and fecal movements after the repeated administration of cathartics and high enemata should at once awaken suspicion, especially if four or five days have passed without an evacuation, even though the patient be entirely free from nausea. It is important to note that the passage of scybalous masses which were contained in the large intestine may mislead the surgeon as well as the nurse, and lull the former into a sense of security. Nothing but the thorough

clearing out of the small intestine and the free escape of gas, with lessening of the tympanites, can justify him in feeling certain that his suspicions of obstruction were unfounded. Fæcal vomiting is, of course, conclusive evidence, but it usually occurs at a stage in the case when the time for successful operative interference has passed.

It may be fairly concluded that intestinal obstruction following vaginal hysterectomy is fatal, and that even when laparotomy is done at the earliest possible moment the chances of saving the patient are very small.

Cases of laparo-vaginal hysterectomy for cancer have been successfully performed by Cleveland,²⁷ Edebohls,¹ and Uspenski.³⁹³
B.16,B.2 The latter states that though the most careful antiseptic and technical precautions are necessary to prevent death from sepsis or shock, the mortality of the procedure has been greatly exaggerated, it being now reduced from over 45 per cent. to less than 28 per cent. The method is suitable for cases where, though the disease is circumscribed and the uterus movable, vaginal hysterectomy is contra-indicated.

Fourteen cases where the gravid and cancerous uterus was removed by vaginal hysterectomy, all recovering, have been recorded by Fenwick,⁴⁹ Taylor,²⁰⁰ Sutügin,⁵⁸⁶ and Mary Almira Smith.²⁷
Feb. June May Apr.26 Sept. The pregnancy in these cases had advanced from two to four months.

Sutügin,¹⁰⁹ who has made an elaborate study of the treatment of cases where pregnancy is complicated by cancer, advises vaginal hysterectomy before four and a half months, where the conditions are favorable for that operation. After four and a half months, unless the cancerous process is far advanced, abortion should be induced, and after the puerperal period the uterus removed. In advanced cases Freund's operation must be performed. Where total removal of the new growth is impossible, or where term is reached, Porro's operation is necessary, with extra-peritoneal fixation of the stump. Where labor has begun and only one lip of the cervix is involved and the os is dilatable, the malignant growths should be curetted or excised, the parts thoroughly disinfected, and the labor terminated by version or forceps, if the fœtus is living, or by perforation and the cranioclast, when dead. When the cervix is rigid, Cæsarian section should be done.

PELVIC CONNECTIVE TISSUE AND PERITONEUM.

Anatomy.—An important study of the lymphatics of the pelvic organs and their connection with inflammations of the uterus and its appendages and with pelvic peritonitis has been made by Poirier ⁷³ Nov. 23, 80; Dec. 7, 21, 28, '89; Jan. 18, 25; Mar. ⁹⁰ by means of the injection of mercury and dissection of these lymphatics in over 300 subjects. He finds that the uterus has three sets of lymphatics, which anastomose freely everywhere: 1. In the mucous membrane: In the cervix the net-work is extremely close. In the body the lymphatics are too fragile to allow them to be injected directly, but the mercury will invade them from a puncture made in the cervix. The net-work is not nearly so fine as in the cervix, but the existence of definite vessels is affirmed. Fridolin and Leopold state that only lacunæ or undefined lymph-spaces are present. 2. Muscular: The vessels from the cervix and lower part of the body, after forming numerous rings of anastomosis in the subserous tissue, are collected into two or three trunks on each side, which accompany the uterine artery along the inferior border of the broad ligament. From the fundus and upper portion two trunks are formed, which pass outward from the upper angles. 3. Sub-endothelial: A very fine plexus, which when injected maps itself out beneath the smooth serous surface. The large trunks springing from the cervix accompany the uterine artery and end in three glands, of which the largest is situated in the angle of bifurcation of the common iliac artery and the others along the line of the internal iliac. When enlarged they can be detected by vaginal examination or by deep pressure in the iliac fossa.

The Fallopian Tubes.—The vessels in the wall of the tubes end in two or three small trunks, which join the two great trunks passing outward from the uterine angles. Poirier did not succeed in injecting the lymphatic plexus in the mucous membrane of the tubes from the uterine mucosa, or *vice versâ*, though he thinks it almost certain that the two anastomose.

Ovary.—"I know of no organ which can be compared to the ovary as regards the abundance of its lymph-channels." From the plexus at the hilus six or eight large trunks ascend with the ovarian vessels, anastomosing with the uterine trunks at the level of the fifth lumbar vertebra.

Retrograde Circulation.—Often during the injections the

mercury was seen to travel along the lymphatics in a direction contrary to the normal stream, as indicated by the valves, and Poirier thinks such retrograde circulation very probably occurs during life in vessels distended by congestion.

Adhesions.—In 300 subjects, mostly of advanced age, it was the exception to find adhesions of the pelvic organs entirely absent. Owing to the existence of the subendothelial plexus of lymphatics, and its free communication with the vessels of the uterine substance, Poirier concludes that no intra-uterine inflammation, except, perhaps, endometritis confined to the cervix, can exist without affecting the peritoneal covering and leading to adhesions. “These adhesions are almost solely made up of a wonderful lymphatic net-work, which is only a prolongation from that of the peritoneal covering.” This can be demonstrated most easily by injection, and the fact also that the mercury in the adhesions occupies definite lymphatics, terminating in efferent trunks, and not merely intercellular spaces.

Uterine Lymphangitis.—Poirier believes that in all uterine affections and their complications lymphangitis plays the fundamental part; if the inflammation be chronic, leading to induration of the cellular tissue (peri- or para- metritis); if more acute, giving rise to abscess, diffused or collected, in the subperitoneal cellular tissue (peri-uterine abscess, phlegmon of broad ligament) or in the glands; or, if caused by a very septic virus reaching the serous lymphatics, pelvic peritonitis. This being so, he concludes that energetic antiseptic treatment of the uterine cavity, from which the lymphatics obtain their supply, will arrest the inflammation. As regards “phlegmon and abscess of the broad ligament,” he believes that the inflammatory process never begins in the centre of that structure, but outside it, *e.g.*, in the pelvic glands along its outer border, and thence invading the cellular tissues of the ligament. He dissents from the description of Guérin, that the ligament is closed in on every side by aponeuroses, and also from the theory of Terrillon, that the induration or abscess in the ligament is secondary to an inflammation in the tube.

As to the pathogeny of suppurative salpingitis, support is given to the commonly accepted theory that the inflammation spreads by continuity along the mucous tract, as against the view of Lucas-Championnière, who states that infection is transmitted

from the uterus "along lymphatics which ramify around the tubes," a statement which, according to Poirier, is anatomically incorrect, as the trunks from the fundus are situated 2 to 3 centimetres from the tubes, whilst those from the cervix are much further removed. In the case of the ovary, however, the condition differs somewhat, for the trunks from the fundus pass just below its attached border and in contact with its efferent trunks; and, though no anastomosis was detected at this point, Poirier holds that in those cases of suppurating ovary following uterine mischief, and occurring without implication of the tubes, it is quite possible that the infection may have traveled along the lymphatic path. The absence of suppuration in the lumbar glands in these cases, and the fact that the ovarian suppuration has not been shown to commence in the attached border of that organ, militate against this view, and it is therefore suggested that infection may possibly occur through the peritoneal lymphatics, or even through adhesions.

Hæmatoma and Hæmatocele.—Taylor^{23 Feb.} records a case where, after the closure of a lacerated cervix, menstruation ceased, but the patient each month suffered from severe pelvic pains. This continued for a long term of years, when he saw her, found and opened by tenotome a cervical atresia, and allowed the escape of considerable, thick, tarry blood. One month later there was the sudden appearance of a pelvic tumor, with peritonitis and death, laparotomy being refused. In commenting on the case, he says: "It is a generally accepted fact that there must be rupture of the tubes before there can be a discharge of the menstrual blood into the pelvic cavity. There must, however, be an exception to this in those cases in which the tubes become, through catarrhal changes, dilated, and the ciliary action destroyed. Then the possibility of gradual oozing of menstrual fluid through the tubes, and becoming a source of low-grade intra-peritoneal inflammation and trouble, is more than likely. Fixation, pelvic abscess, sterility, may be the results without a history of an active peritonitis. Pelvic hæmatocele, of greater or lesser size, from rupture of one of the veins of the uterine or ovarian plexus can hardly be of as rare occurrence as we are led to believe. It seems incredible that a portion of the body so rich in blood-supply, so subject to various physiological and pathological phenomena, should escape the varicose and phlebotic changes which we find in other less vulnerable parts. In a

number of instances patients have come to me complaining of pelvic soreness or pain, dating invariably from some extra effort whilst menstruating. A diffused pelvic fullness, or decided thickening of one or other of the broad ligaments, is found upon examination. Fortunately, the true condition is not often revealed by laparotomy or post-mortem examination. Generally but little more than rest, with small doses of iodide and bromide, are needed to, in a short time, relieve all symptoms and local evidence of trouble. I cannot but think that these are cases of intra- or extra-peritoneal hæmorrhage, small in quantity and readily absorbed. If this be so, why not large hæmorrhages and with more important results?"

Veit,^{27 Oct.} in speaking of the diagnosis of hæmatocele, says that blood effused free into the abdominal cavity cannot be demonstrated because it is not palpable. Blood never causes adhesions. Blood coagulates in the abdominal cavity only when it comes in contact with adhesions. Therefore the only symptoms are those of hæmorrhage,—collapse, weakness of the heart, small frequent pulse, pallor, chill, etc.,—and in order to diagnosticate hæmorrhage into the abdominal cavity other forms of hæmorrhage must be excluded. For further reference to the pathology, treatment, and clinical history of these conditions the reader is referred to the section on "Ectopic Gestation."

Parametritis and Pelvic Abscess.—As Parish^{61 Jan. 18} very clearly states, pelvic cellulitis, until recent years, was thought to be a most frequent occurrence, and, consequently, abscesses of the pelvic areolar tissue the most frequent form of abscess within the female pelvis. Modern abdominal surgery has, however, shown the fallacy of such convictions, and it is now known that inflammation of the pelvic areolar tissue is of rare occurrence, as compared with accumulations of pus either within the Fallopian tube, the ovary, or the peritoneal cavity. It is certain, however, that it does occur as a result of acute areolar inflammation, either as a sequel to labor or because of traumatism to the cervix, vagina, or external genitals. Septic infection of the local lymphatics, or more rarely of the veins, precedes the abscess. The local septic infection arises from a failure to preserve an aseptic condition of the parturient canal either during or subsequent to labor, or in connection with operations on the external genitals, the vagina, or

the uterus. Chronic pelvic cellulitis occurs only as a sequel to some of the complications of pelvic abscess. When fistulous tracts persist after the escape of pus into the intestinal canal, or into the bladder, or in some other direction; or where degeneration and partial suppuration of a pelvic gland occurs, then pelvic cellulitis becomes chronic. The abdominal surgeon has demonstrated in innumerable instances that chronic cellulitis has no independent existence. The difficulty of distinguishing an abscess of tubal from one of areolar origin is increased by the fact that associated with pelvic areolar abscess may also co-exist extensive plastic inflammation of the pelvic peritoneum. Upon this obscurity rests, in part, the difficulty in determining the relative frequency of areolar and tubal abscess. As in past years cases of tubal abscess were unwittingly called areolar abscess, so, to-day, it would seem that areolar suppuration with adhesions is liable in some instances to be pronounced intra-tubal abscess even after the abdomen has been opened.

The successful treatment of pelvic abscess often demands an exercise of the most deliberate judgment and the highest operative skill. It is true that a considerable number of areolar abscesses result in cure by a spontaneous escape of the pus, chiefly into the vagina or into the rectum. But the frequency with which permanent fistulæ follow spontaneous evacuation is sufficiently great to render it unwarrantable to wait for such an event. The undoubted indication is to establish perfect drainage through either the vagina or the abdominal wall as soon as safely practicable. Perfect drainage will alone meet the surgical indication in such an abscess, but is it possible always to determine whether or not the pus is in the areolar tissue? Having the constitutional symptoms of an abscess, the location of the induration or of fluctuation may aid in the diagnosis; that is, the patient having constitutional evidence of suppuration, should fluctuation or induration exist in front of the bladder or in the iliac fossa, and not be present in the locality of the tubes and ovaries, an areolar abscess probably exists.

In areolar abscess, if there is bulging in the vagina, an opening should be made at that point. In opening through the vagina, the median line posteriorly must be the elective point as laterally, and anteriorly there is danger of wounding either the uterine

artery, the urethra, or the bladder. It is better to avoid the knife after passing through the mucous membrane, and to push a blunt grooved director into the abscess and dilate the opening by passing in along the groove a strong pair of closed forceps, separating the blades upon their withdrawal. If the finger is introduced it will be found that when the pus is in the areolar tissue, there is, after its escape, considerable, if not complete, collapse of the abscess-walls, and their inner surfaces are fibrillated; but if an intra-tubal abscess has been opened the interior will be smooth and there is less tendency for the walls to approach each other, the latter being prevented by reason of the dense peri-tubal adhesions. If the opening secured is sufficiently large, gently syringe the cavity with a solution of corrosive sublimate, 1 part to 3000, and introduce a rubber drainage-tube.

In many cases the suppuration begins in the areolar tissue, so high up in the true or the false pelvis that an opening *per vaginam* is unsafe. Then an incision can be made through the abdominal walls, and usually with the most satisfactory result. The most favorable point in many instances will be above Poupart's ligament, along either its inner or its outer half, not extending the incision so as to endanger the deep epigastric artery, or the iliac vessels. The incision should be made early, and carried, it may be, deep into the pelvis, until pus is reached, taking care to keep external to the peritoneum. An early incision can be made at this point and is peculiarly advantageous, for thus can be avoided the establishment of fistulous tracts and the serious crippling of the pelvic organs.

When the abscess is of the intra-tubal variety drainage is not so safely secured, nor can a cure be expected from it. The early removal of the appendages after a median abdominal section is the only rational and reliable procedure. The most careful toilet of the peritoneum must be effected, and in most instances the drainage-tube is necessitated. Usually, if the case is seen early the diagnosis is easy, yet in some cases the diagnosis is exceedingly difficult, and may not be possible until after the abdomen has been opened. In case of doubt as to the location of the pus, exploratory laparotomy may be indicated, and, if the pus is in the areolar tissue, a second and extra-peritoneal incision is much better than to empty the abscess through the peritoneal cavity.

To avoid disastrous results or the formation of permanent fistulous tracts, it is necessary to make it an inflexible rule to operate early in all forms of pelvic abscess.

These views, in their essential points, agree with those of most of the writers of the past year (Péan, ⁵⁸⁹ July 26; Wylie, ²⁷ Mar.; Smith, ²² Mar. 21; Wiedow, ¹ Mar. 22; Barnard, ²⁶ June; Dunning, ¹ Nov. 8; Purefoy, ²² May 14; Taylor, ²⁰⁰ Sept.; Chéron, ¹¹⁸ Dec.; Cushing, ²³ July; Adams, ⁷² Sept.; Abbott, ¹⁰⁵ May 1; McLaren, ²⁷ Sept.; ¹⁰⁵ Sept. 15; Robson, ⁴⁹ May; Gilcreest, ⁸² Jan. 25; Baumgartner, ⁸⁴⁹ Mar.), who have reported cases or have discussed the matter from a surgical stand-point.

Bowreman Jessett ⁶⁷³ Jan. records a case of pelvic abscess caused by a silk ligature remaining after an ovariectomy. Similar cases are reported by Smith, Tait, Barnes, Fenwick, and others. ⁴⁹ Nov., '89. Terrillon, ¹⁶⁴ Nov. 14, in a case with persistent sinuses from a purulent cavity under the peritoneum of the iliac fossa and true pelvis, cut down on the ilium and trephined behind the cotyloid cavity, irrigated and drained, with a resulting cure.

Hardon ²⁰⁷ Dec., '89, calls renewed attention to the value of his plan of vaginal aspiration of the serum in the exudation of an acute cellulitis in its first stage. (See ANNUAL for 1888.) He finds that three punctures on each side of the uterus are usually sufficient, and if the effusion is present behind the cervix one or two additional punctures in that locality are also required. The fluid which is withdrawn is a bloody serum, varying in quantity from 1 to 2 fluid drachms at each puncture. As a rule, it is not necessary to anesthetize the patients, although he has sometimes done so on account of extreme nervousness and dread of the operation. The pain is not severe.

The relief which follows the withdrawal of the fluid is immediate. The patient usually falls into a quiet sleep, which is in marked contrast to the pain and restlessness which had previously existed. The pulse and temperature rapidly decline, the acute pain gives place to moderate tenderness upon pressure, the constitutional symptoms disappear, and in forty-eight hours the patient feels as well as before the commencement of the attack. The most gratifying result of this treatment, however, is found in the fact that subsequent vaginal examination will show that no solidified plastic lymph remains in the pelvic cellular tissue to give rise to troublesome *sequelæ*. A slight thickening at the site of the former œdema is all that is left as a reminder of the acute inflammation.

If, as is usually the case, disease of the tubes had previously been present, this condition is still found to exist. The effect of the aspiration is simply to cut short the acute inflammatory attacks, and not to remove or even palliate its cause.

Hornibrook¹⁰⁶_{Feb.} and Byrne²⁷_{May} urge the value of the old treatment of peri-uterine inflammation by poultices, blisters, iodine, etc., Hornibrook favoring bleeding and calomel in acute cases.

Peritonitis.—Bumm⁴⁸_{Jan.} describes three varieties of peritonitis: aseptic, septic, and specific. Aseptic peritonitis arises from chemical, thermic, or mechanical irritation. It is characterized by the effusion of lymph, which tends to organize and to cause adhesions; as a rule, it is circumscribed, unless the irritating agent is applied to the whole surface of the peritoneum. The third variety—specific tubercular peritonitis—may be dismissed before the second is discussed.

Bumm doubts the existence of a gonorrhœal peritonitis. The microbes of gonorrhœa, according to him, can only exert their morbid influence on mucous membranes and die in serous cavities. Gonorrhœal pus escaping from a ruptured Fallopian tube, as a rule, acts only as an aseptic foreign body, and becomes encysted. In the case of mixed infection, where pyogenic germs are mixed with gonococci, septic peritonitis may occur. There are two distinct sub-varieties of septic peritonitis, “streptococcus peritonitis” and “putrid peritonitis.” The first sub-variety is essentially a disease of the puerperium, but may be caused by the pressing up of septic foci in the peritoneum or by infection during operations. The disease is almost always fatal. It sets in very rapidly. The peritonitic exudation remains clear and sweet for a certain time, and during that period teems with streptococci. These organisms, when gathered from fluid in this condition, are intensely infectious. The physical signs of peritonitis at this time are little marked. Should the patient live for a few days, the peritoneum becomes injected and covered with fibrinous deposit. The fluid is now puriform, and the streptococci which it contains acts with less virulence when introduced into other organisms. When cultivated separately they also lose much of their virulence. Putrid peritonitis is the form still too familiar to operators. The peritoneal exudation is sanious and turbid from the first. It does not contain one specific micro-organism, but a mixture of germs. It is not infec-

tious when a small quantity is introduced into the peritoneum of an animal. When germs enter the peritoneum in the course of an operation, where precautions are neglected, or where the cavity is too long exposed, they may find themselves surrounded by a favorable culture medium. The morbid process once established, matters go from bad to worse, and the sanious fluid which is produced becomes absorbed into the blood with disastrous results. Putrid peritonitis is developed slowly; the streptococcus variety is, on the other hand, characterized by the violent symptoms which rapidly follow its invasion.

As Penrose,⁹_{July 5} states, peritonitis in women is generally the result of disease of the Fallopian tube. The sequence of events is in most cases slow,—salpingitis, closure of the fimbriated end of the tube, distension with pus or other material, more or less septic. The resulting peritonitis, if acute and general, is caused by sudden rupture and escape of the tube-contents into the peritoneum; or, if chronic, by gradual leakage from a small rupture, or by direct extension of inflammation through the tubal or abscess-wall. Gordon²⁷_{Aug.} raises the point that appendicitis is more often the cause of peritonitis in males than in females. The close proximity of the Fallopian tube of the right side to the appendix renders the latter liable to frequent involvement in peritonitis coming from the tube, and from the similarity of the symptoms to those of appendicitis may easily lead to error in diagnosis. Gordon also urges the necessity of prophylaxis by treating or preventing any catarrhal condition of any portion of the genital tract. In the beginning of an attack of acute peritonitis, purgation by calomel and salines is important. Opiates should not be given unless the pain is unbearable. Where the peritonitis becomes general, and signs of pus are manifest, laparotomy (Wylie,²⁷_{Mar.} Gordon,²⁷_{Aug.} Davis,²²_{Mar. 26} Wallace,²²_{Apr. 6} Price,⁹_{Aug. 9}), evacuation of the pus, and irrigation are imperatively demanded. Where the peritonitis does not go on to suppuration, but results in the formation of adhesions, with suffering and impairment of the genital functions, much relief may often be given by a systematic course of local depletion by hot douches, glycerin, wool tampons, iodine, and cathartics. When all efforts in this direction fail, our only resource is removal of the damaged organs.

Drainage of the Peritoneum.—This is discussed by Delbet,⁴⁸_{Feb., Mar.} Shoemaker,¹_{June 21} and E. W. Cushing,⁵⁹_{Sept. 6} all of whom favor

the procedure and arrive at about the same conclusions, namely, that, in general, drainage should be used in all cases in which there are intestinal or pelvic adhesions; in cases where the peritoneum is manifestly diseased; in cases where irrigation has been required, or where there is any doubt as to the aseptic condition of the pelvic or abdominal cavity.

Tubercular Peritonitis.—By far the best paper of the past year on tubercular peritonitis is that by William Osler,⁸⁵⁸ from which the greater part of the following is taken. He considers that, anatomically, the classifications which have been made of tubercular peritonitis are not altogether satisfactory. It is customary and correct to exclude the cases of scattered miliary tubercles in the diffuse infective disease, and also those cases in which the peritoneal surface of tubercular ulcers is alone involved. Practically, the great differences which we see post-mortem in this condition result from the situation, the rate of growth of, and the degree of inflammation accompanying the tubercles, and whether there is much or little exudation—serous, purulent, or hæmorrhagic. The anatomical basis in all cases is essentially the same, and the variations which we meet, though distinct and marked, are scarcely sufficient to warrant the elaborate subdivisions of this disease made by certain writers. In reviewing a number of post-mortems in this disease we find that they fall naturally into the following categories: 1. *Acute miliary tuberculosis*, characterized by a sudden onset, a rapid development, and a serous or sero-sanguineous exudation. 2. *Chronic caseous and ulcerating tuberculosis*, characterized by larger tuberculous growths, which tend to caseate and ulcerate, leading often to perforations between the intestinal coils and a purulent or sero-purulent exudate, often sacculated. 3. *Chronic fibro-tuberculosis*, in which the process may, from the outset, be subacute, or may represent the final result of the miliary form. There is little or no exudation, and the tubercles are hard and pigmented. There exists the closest analogy between tubercle as we see it on the peritoneum and as it occurs in the lung,—the fresh miliary eruption, the caseous, ulcerating masses, and the chronic fibroid, pigmented nodules may be studied with equal facility in either structure. A few practical points in the morbid anatomy may be mentioned. In many cases the process is entirely local. Thus, in 5 out of 17 cases the condition was confined to

the peritoneum. In from 30 to 40 per cent. of the cases in woman the Fallopian tubes are found affected. The process is commonly confined to the distal ends, and may be primary, which is usual, or is secondary to the peritoneal involvement. A point, worthy of attention on account of its importance as an aid in diagnosis, is the frequent involvement of the pleura. It is often only a dry pleurisy, occurring most frequently without pulmonary affection, and due to direct extension through the diaphragm. The pericardium is also liable in these cases to be the seat of an adhesive tubercular inflammation. Tubercular peritonitis occurs at all periods of life. It is common in children, in whom it is often associated with intestinal and mesenteric disease. Full statistics dealing with its prevalence in infancy and childhood are not available. It is most common between the ages of 20 and 40. In old age it is rare, but it may occur even in advanced life. The disease is certainly more prevalent among females. It is stated that the disease is more common in the negro than in the white race, but there are no figures which could enable us to arrive at a definite opinion as to the relatively greater frequency of the disease among them.

Clinically, it is extremely difficult to make a satisfactory classification of the cases of tubercular peritonitis, and we will here only refer to certain special features in the mode of onset and to peculiar symptoms not, as a rule, very fully discussed. The process may be completely *latent*, and the eruption take place so slowly and so painlessly that the patient may not have presented a single symptom of abdominal disease. The condition has thus been met with in the operation for hernia, and more frequently still in association with ovarian tumor. The onset of the symptoms may be *sudden*, so that the diagnosis of enteritis or hernia may be made. This suddenness of onset is very deceptive and usually leads to the diagnosis of a simple acute peritonitis. The disease may set in with pronounced *gastric symptoms* and simulate ulcer or cancer. A more common mistake is confounding tubercular peritonitis with *typhoid fever*, which it may simulate very closely. *Ascites* is a frequent symptom, but it does not, as a rule, become very marked; thus Biat,¹⁰⁰⁶ in an analysis of 81 observations, found only 13 instances with extensive ascites. In the acute miliary tuberculosis with rapid exudation the effusion may be bloody, but this is not so common as in cancer, though the opposite statement is usually

made. It has frequently been mistaken for the effusion in connection with cirrhosis, of which, indeed, it may sometimes be a complication. It is somewhat remarkable with what frequency acute tuberculosis of the serous membranes occurs in this disease. Moroux¹⁰⁰⁶₈₃ and Wagner³²⁶_{B.34} have called attention to the involvement of the peritoneum, which in my experience is not so often affected as the pleura. I have notes of 6 cases in which acute tubercular pleurisy occurred as a final complication in cirrhosis. Cases with extreme *tympanites* are also common. This condition, the result of impairment of the tone of the muscular coats, is a very constant feature in all forms of the disease. Many writers refer to the fact that the temperature in tubercular peritonitis may be normal, but it is not generally known that the temperature may be subnormal for weeks or months at a time. In the cases of fibrous tubercle without much inflammatory process or effusion, there is, as a rule, very slight fever and subnormal temperatures are common. An increase in the skin-pigment, particularly on the face, is an occasional symptom in tuberculosis of the peritoneum.

To the occurrence of tumor-like formations in tubercular peritonitis we are indebted for much of the increase in our knowledge on this subject, as the errors in diagnosis have shown the frequency with which these tumors occur and also how amenable the condition is to surgical treatment. The question has not been fully considered by any recent writer, yet its importance may be gathered from the fact that, in 96 cases in which laparotomy was performed, in 37 the diagnosis was tumor, ovarian or otherwise. We may recognize anatomically, and possibly clinically, four groups of cases in which, with tubercular peritonitis, tumors occur and may be felt on examination: First, omental tumor; second, sacculated exudation; third, retracted and thickened intestinal coils; fourth, mesenteric glands.

The *diagnosis* of these peritoneal tubercular tumors offers difficulties which vary greatly in the different varieties. The omental tumor is probably a less frequent source of error than any other, but, as an identically similar condition may exist in cancer, it is not always possible, unless there is marked tubercular disease elsewhere, to determine the precise nature; and, as we have seen, even an acknowledged expert like Gairdner may be led astray. The lumpy, nodular character of the mesenteric tumors gives to

them also a certain degree of distinctness. The mistake is sometimes made of confounding the large caseous nodules situated between the intestinal coils with the mesenteric glands. The possibility of their recognition depends very much on the degree of distension of the bowels, as extreme tympanites may completely cloak a very large tumor of this character. The tumors formed by contracted and thickened intestinal coils usually lead to error in diagnosis. The recognition of the saccular exudation, more particularly its differentiation from cystic ovarian disease, offers really serious difficulties, the extent of which may best be appreciated by the fact that of 96 cases of laparotomy in tubercular peritonitis, in not less than 30 ovarian disease was supposed to be present. Such being the case, it may be worth while to discuss briefly certain diagnostic details. There is no single criterion which enables us to say in a given case that the condition is one of encysted peritonitis; nor, indeed, is there any special group of symptoms which can be regarded as distinctive. It were folly to lay down, in parallel columns, differential rules in an affection in which, again and again, the ablest diagnosticians in our profession have erred. It will suffice merely to touch upon the points most suggestive, in individual cases, of tubercular trouble:—

First: The history of the patient and of the disease. Tubercular antecedents are common. Evidence may exist of old tubercular lesions. Gradual failure in health and strength may perhaps be taken into consideration, but it must not be forgotten that in many of the cases the patients have been robust and well nourished. The mode of onset is in the majority of instances gradual, but this is such a variable factor that it is not of very much value; perhaps the most which can be said on this point is that there can usually be elicited a history of obscure abdominal pains, irregular febrile attacks, and altogether a greater degree of gastro-intestinal disturbance than generally accompanies the slow evolution of ovarian cysts. If the case has been under observation for some time, the fever-record should be of great assistance, as high or very low temperatures more commonly occur in this condition; though it is true that in inflamed and suppurating ovarian cyst there may be fever of a hectic type.

Second: The local physical signs. If possible, these are more deceptive than the history and symptoms. The question is not so

much between the characters of a sacculated exudation and ascites, but it is the extremely nice one of discriminating between two varieties of sacculated effusion, ovarian and peritoneal. In typical cases the physical signs have conformed in every particular to those of cystic ovarian disease. There are a few indications which may at times be useful; thus, when the sacculated tumor is limited and small, the outlines may not be so definite and clear as in ovarian disease. This is a point referred to by several writers. The position and form may be variable, owing to alterations in the calibre of the surrounding intestinal coils, of which, in part, the walls are composed. At the periphery of the tumor, irregular, nodular bodies—cheesy masses—may sometimes be felt, which in several instances have led to the diagnosis of malignant disease. Depression of the vaginal wall is not a safe indication one way or the other, as the condition is mentioned as present in ovarian tumor as well as in encysted peritonitis.

Third: In every case the condition of the tubes and of the lungs and pleura should be most thoroughly examined. The association of a tubal tumor with an ill-defined, anomalous mass in the abdominal cavity should arouse suspicion at once. So also the evidence of involvement of the pleura or of the apex of one lung. It is rather surprising, in looking over the reports of cases, how little attention seems to have been paid to these most important and common concomitants of tubercular peritonitis.

Curability.—Until within the past few years, the general opinion in the profession has been that this disease is incurable; and in looking over the text-books of medicine, with but few exceptions—Fagge a notable one—the prognosis is given, as in the words of Flint, “always fatal.” Henoch,¹⁰⁶³ in his admirable account of this affection in children, says that when recovery has followed in certain cases in his practice he has thought the diagnosis incorrect, and that peritonitis had really been of the simple chronic form. Yet there exist not a few reports among the older writers indicating that a form of chronic peritonitis, not to be distinguished from the tubercular, did occasionally get well. More recently, McCall Anderson, of Glasgow, ⁶/₇ in a clinical lecture published in 1877, reported 3 cases illustrating recovery in tubercular peritonitis. The history and the symptoms left no doubt as to the correctness of the diagnosis, but the cases were regarded as

altogether unique. Gee, ⁶_{Jan. 1, '81} in 1881, stated "that recovery from tubercular peritonitis is common." Gairdner also has insisted upon the occasional cure in this affection, while admitting that there was a hiatus in our knowledge of the changes undergone in the progress toward healing. Ashby, ¹⁰⁶⁴_{v. 3} in his article on peritonitis in children, says "a large number of cases completely recover." Fenwick, in his recent lectures, speaks less hopefully of permanent cure. The evidence has been rapidly accumulating to show that in a considerable number of cases recovery in this disease is possible, either spontaneously or after operative interference.

(a) *Spontaneous Cure*.—There is no inherent improbability why tubercles on the peritoneum should not undergo involution, as they do elsewhere. Anatomically the peritoneal growth bears in its evolution a close analogy to the pulmonary, and this is still further borne out by the retrograde changes through which it passes. Just as the aggregations of miliary nodules in the lung may undergo the changes which we speak of as healing, becoming hard and fibroid, so in the peritoneum the tubercle tends in many cases to become sclerotic, and passes into a condition in which it is practically harmless. This beneficial result is more likely to be seen in cases belonging to the third group, in which, from the outset, the process is subacute and not associated with much exudation; but there are cases on record in which recovery has followed even after extensive effusion. The anatomical changes are, in brief, these: fibroid and pigmentary induration of the tubercles, absorption of the exudate, transformation of the fibrinous material into connective tissue, with the union, to a greater or lesser extent, of the intestinal coils and of the peritoneal surfaces with each other. The cases which are most likely to terminate favorably are those in which the infection is limited to the peritoneum, the inflammation of moderate grade, and the effusion slight in amount and sero-fibrinous. An adhesive inflammation, as it is termed, may accompany the process from the outset, and a gradual sclerosis may overtake the tubercles and render them harmless. Caseation and ulceration, with a sero-purulent exudation, preclude the possibility of spontaneous cure. Extension to the pleura and lungs and the co-existence of intestinal or tubal disease are conditions equally unfavorable to permanent recovery.

(b) *Cure by Operation*.—The beneficial effects which, in a

number of cases, followed the opening of the peritoneum when a sacculated exudation was mistaken for ovarian tumor, encouraged surgeons to perform laparotomy in ordinary cases of tubercular peritonitis accompanied with much effusion. The questions remain for consideration, What cases are most suitable for operation, and how can we explain the beneficial influence? Undoubtedly, cases with fresh eruption and considerable effusion, whether free or sacculated, offer the best chance of recovery, as the disease is more likely to be primary in the peritoneum, the general condition is usually better, and the subsequent chances of general infection are much slighter. When the Fallopian tubes are extensively diseased, and when the process has extended through the diaphragm to the pleura, the condition is, of course, less favorable. The existence of marked omental tumor, in the form of a transverse ridge, need not necessarily be an objection to operation, as spontaneous resolution of such masses may take place. In cases, then, with somewhat sudden onset, rapid development of ascites with fever of moderate grade, we may be most sanguine of success. In the class of cases with extensive caseous masses in the peritoneum and a purulent exudation the outlook is necessarily less hopeful; but even in such instances, particularly when the exudation is sacculated, laparotomy may be advised as a palliative measure. In the chronic adhesive form no benefit can be expected to follow the operation, which can only be intended to remove an omental mass or to open a sacculated effusion. In the majority of the cases of this group nature is effecting a cure in which she scarcely needs outside assistance, and the danger lies not so much in the peritoneal disease as in the risk of pulmonary affection. It is difficult to explain the beneficial results of the operation. It is interesting to note that not alone in tubercular peritonitis, but in other forms with effusion, the simple opening and drainage of the cavity has seemed to exercise a very beneficial effect on the subsequent course of the disease.

Lauenstein<sup>336
N^o. 42</sup> believes that the withdrawal of the ascitic fluid is an important factor, as the tubercle bacilli cannot thrive on the dry peritoneum. He also argues that, as Koch has shown that direct sunlight will kill the tubercle bacilli in from a few minutes to an hour, the thorough examination of the abdominal cavity, which requires a somewhat prolonged exposure to bright light,

may exert a curative influence. This supposition is supported by the fact that in no other form of tuberculosis is incision and drainage followed by a cure, and in no other form is direct sunlight necessary as in laparotomy. Maurange¹⁶²_{Sept.} claims good results from removal of the ascitic fluid by aspiration, antiseptic washing of the peritoneal cavity, and removal of the fluid by the aspirator, followed by the injection of variable quantities of a mixture of 1 drachm (4 grammes) of iodoform in 25 drachms (100 grammes) of white oil of petroleum. He has never seen any symptoms of iodoform poisoning after this procedure. He gives statistics of 71 cases in which laparotomy had been done; 59 were operative successes and one-half were doing well at the end of a year. König³³⁶_{No. 35} notes 137 cases, of which 23 were greatly improved, 84 reported cured, and 30 free from tubercular symptoms for several years. Seventeen cases have been recorded during the past year (Haynes,⁴⁴_{Oct.} Mundé,²⁷_{June} Kelly,⁷⁶⁴_{Nov.} Gardner,²⁸²_{Mar.} Terrillon,²²_{July 9} Robson,⁴⁹_{May} Schranz,⁸⁴_{Mar.}), of which 4 died shortly after the operation, 5 are noted as "practically well," 6 showed "great improvement," and 2 "temporary improvement."

ELECTRICITY IN GYNÆCOLOGY.

Besides the references already noted in this section, we would call attention to the very convenient table (see page 57) of indications for the employment of electricity.¹³⁹_{May}

Mundé²⁷_{June} finds the following diseases benefited by the use of the faradic current: Deficient development of uterus and ovaries, amenorrhœa, subinvolution and menorrhagia, submucous fibroids. The galvanic he finds most useful in hyperplasia uteri, chronic oöphoritis and pachysalpingitis, chronic pelvic cellulitis and peritonitis, local and reflex pelvic neuralgias, obstructive neuralgic dysmenorrhœa, uterine fibroids. Other writers favoring electricity in these conditions are: Palmer,⁴²⁶_{Nov.} Sprague,²³⁴_{Aug.} Hayd,¹⁷⁰_{May} Graydon,¹⁴⁹_{Aug.} Hobart,⁹⁰_{May} Smart,¹⁸⁷_{July} and Hall.²⁷_{Dec., '89}

NEW DRUGS.

Ichthyol.—Freund,⁶_{May 24} Reitmann, and Schövaner have found this drug of considerable value as an analgesic and resolvent in parametritis, perimetritis, affections of the ovaries and tubes, cervical erosions, and pruritus vulvæ. It is used locally in the form

of a 10-per-cent. glycerin solution of the sulphichthyolate of ammonium, applied on tampons and internally as a pill. The disagreeable odor of this drug can be masked by the addition of cumarin.

Aristol.—Von Swiecicki⁶⁹_{June 19} has obtained very favorable results in lessening the discharge and relieving local pain in cases of parametritis, endometritis, erosions, and vulvar eczema by the employment of various preparations of aristol. Gaudin¹⁵⁴_{July 15} finds that in cervical epithelioma it is not only a powerful disinfectant and deodorizer, but an efficient promoter of cicatrization. The drug is soluble in ether and in oils, lanolin, etc. It is employed locally in the form of powder, in solution, in ointment, as a gauze in suppositories. It is not toxic and has no unpleasant odor.

NOSLOGY.	PATHOLOGY.	SYMPTOMS.	INDICATIONS.	TREATMENT.
<i>Amenorrhœa</i>	Imperfect development and malnutrition; atony.	Presence or absence of menses (prognostic); nervous depression.	Stimulation; improved nutrition.	<i>Faradization</i> .—Gen. or local. <i>Galvanization</i> .—Central or local, negative pole direct.
<i>Dysmenorrhœa</i>	Depressed nervous tone.	Hyperesthesia; neuralgia.	Sedation; sometimes stimulation.	<i>Sedation</i> .—Galvanization, with positive pole direct. <i>Stimulation</i> .—Faradization, direct or indirect.
<i>Subinvolution (Acute)</i> ..	Congestion.	Hypersecretion.	Stimulation and contraction.	Direct faradization.
<i>Subinvolution (Chronic)</i>	Hyperplasia.	Deficient secretion; hystero-neuroses.	Absorption of fibrous tissue and improved nutrition.	<i>Galvanization</i> .—Negat. pole direct. Electro-puncture.
<i>Superinvolution</i>	Atrophy.	Amenorrhœa.	Stimulation and improved nutrition.	Direct faradization. <i>Galvanization</i> .—Negat. pole direct.
<i>Oöphoralgia</i>	No tissue change.	Hyperesthesia.	Sedation.	If pressure aggravates—galvanization. If pressure ameliorates—faradization.
<i>Chronic Oöphoritis</i>	Congestion and inflammation.	Hyperesthesia.	Sedation.	<i>Galvanization</i> .—The positive pole direct.
<i>Chronic Pelvic Inflammation</i> .	Pelvic congestion; exudation.	Hyperesthesia; pressure and reflex symptoms.	Sedation; absorption, relief of local congestion.	<i>Sedation</i> . — Galvanization, positive pole direct. <i>Absorption</i> .—Galvanization, negative pole direct. Electro-puncture.
<i>Uterine Displacements</i> ..	Congestion; inflammation; atony.	Depend upon tissue changes.	Depend upon tissue changes.	<i>Congestion</i> . — Galvanization and faradization, positive pole direct. <i>Inflammation</i> . — Galvanization, positive pole direct. <i>Atony</i> .—Faradization. In antelexion, direct electrode in the rectum; in retroflexion, direct electrode in the bladder.

MISCELLANEOUS.

Currier ²³_{Apr.} notes the case of a woman, the mother of five children, who, during a laparotomy for the removal of the uterine appendages, was found to have a uterus bicornis unicollis. Krug ²⁷_{June} records an instance of the very rare condition of congenital inguinal hernia of the uterus, left tube, and ovary. A radical operation was done, and the patient died from cardiac failure on the fifteenth day.

Edwards, ²_{Feb.} on performing a laparotomy for a supposed ovarian cyst, found instead a hydatid cyst closely incorporated with uterus and bladder. It was removed, the pelvic cavity cleansed, and the abdomen closed. The patient died of sepsis on the fourth day.

DISEASES OF THE OVARIES AND TUBES.

By E. E. MONTGOMERY, M.D.,

PHILADELPHIA.

ECTOPIC GESTATION.

Lawson Tait¹⁰²⁸_{v.1,p.443} adheres to his former classification:—

I. Ovarian possible, but not yet proved.

II. Tubal in free part of the tube is (*a*) contained in tube up to fourteenth week, at or before which time primary rupture occurs, and then progress of gestation is directed into (*b*) abdominal or intra-peritoneal gestation, uniformly fatal (unless removed by abdominal section) primarily by hæmorrhage, secondarily by suppuration of the sac and peritonitis; (*c*) broad ligament or extra-peritoneal gestation; (*d*) may develop in broad ligament to full time and be removed at viable period as living child; (*e*) may die and be absorbed as extra-peritoneal hæmatocoele; (*f*) may die and suppurating ovum may be discharged at or near the umbilicus, or through the bladder, vagina, or intestinal tract; (*g*) may remain quiet as a lithopædion; (*h*) may become abdominal or intra-peritoneal gestation by secondary rupture.

III. Tubo-uterine or interstitial is contained in part of tube embraced by uterine tissue, and, so far as is known, is uniformly fatal by primary intra-peritoneal rupture before fifth month,—a theory which discredits ovarian gestation and regards abdominal as always secondary to tubal.

W. H. Wathen¹_{Mar. 15} emphatically denies the existence of primary abdominal pregnancy, and says: “No ovum has ever attached itself primarily to the peritoneum, nor is it possible for it to do so; nor has the placenta become separated from its attachment to the tube and then attached itself to any other structure. The placenta may finally attach itself to any of the abdominal viscera by making epiphytic inroads upon other structures, and it may gradually become partially or wholly detached from its tubal connection.”

(G-1)

Lusk⁴⁰_{Oct} divides abdominal pregnancies into two classes:—

I. Where the tubes are reported as intact, or where there exists direct communication with the tube on the affected side and the sac-cavity,—cases of undoubted primary tubal pregnancy.

II. Cases where the tubes are reported as intact and not in communication with the sac: Muller's case of extra- and intra-uterine pregnancy (the former had developed in Douglas's pouch and by later development reached the tubes); Schlectendahl's case, in which the ovum was found near the spleen, containing a fœtus 15 centimetres in length. The woman had died of intestinal hæmorrhage; sac the size of the fist and surrounded by the intestines; uterus and tubes were normal. While it is difficult to understand how the ovum may implant itself upon the peritoneum and receive its nourishment therefrom, it is quite as incomprehensible to appreciate how the tube may be ruptured and the ovum and its envelope escape and find insertion at some distance, while the tube closes up without showing any evidence of the previous rupture. It does not seem any more difficult to believe that the peritoneal irritation or inflammation in the neighborhood of the diseased tubes may afford a proper surface for the implantation and nutrition of the fecundated ovum, and, in the cases just quoted, nothing seemed to indicate its possibility.

Johnstone²⁷_{Oct} says: "The placenta develops from adenoid tissue of endometrium, which is ordinarily sealed from contact with the ovum by epithelium, giving a denuded surface; the development of the placenta depends further upon the agency of the sperm-cell, which acts as a sponge or skin-graft, inducing formation of new tissue. Exfoliation of the placenta at term is due to exhaustion of spermatie influence, while utero-tubal tract and peritoneal surface furnish suitable conditions for the development of the placenta. The ovary does not possess the necessary lymphatic structure." Jaggard²⁷_{Oct} thinks it is useless to discuss the probabilities of ovarian pregnancy; it is a fact of nature. The cases have been established. Lusk also believes that ovarian pregnancy occurs without doubt, and quotes as evidence the cases of Patenko and Paltauf. Price¹⁰²⁹ has recently reported a case which seems to positively indicate the development of the fœtus within the ovary.

While the cases quoted demonstrate the possibility of abdominal and ovarian gestation, it is none the less true that these

conditions are the exception, and not the rule. In a great majority of cases ectopic gestation occurs in some part of the tube.

Etiology.—To properly discuss the causes of ectopic gestation we must consider the physiology of ovulation and impregnation.

Zinke²⁷_{Feb.} says the following theories are generally accepted: 1. That the mature ovum, under normal conditions, is discharged from the Graafian vesicles at the catamenial period. 2. That the ovum is ordinarily taken up by, or finds its way into, the fimbriated extremity of the Fallopian tube, passing through the latter to the womb, there to await further development or escape with the menstrual discharge. 3. That the ovum may be impregnated shortly before its escape from the Graafian vesicle, or soon after, or within the Fallopian tube, or after its appearance in the uterine cavity. 4. That both the sterile and fertilized ovule may be (*a*) arrested at any point in its course through the tube, or it may be absorbed or developed, as the case may be; (*b*) it may drop into the peritoneal cavity, there to meet the same fate; (*c*) a fecundated ovule may traverse the peritoneal space and enter the tube on the opposite side, there to be arrested within its canal or to find its way into the uterine cavity. 5. It is declared possible by some that the ovum, after its arrival in the corporeal cavity, may, in certain instances, not remain there, but proceed onward and enter the opening of the opposite tube, become fixed there, and develop within the tube or the substance of the uterus. This appears to be far-fetched, but it may be none the less not impossible. 6. The Fallopian tube on the side of the discharged ovule may be momentarily or permanently paralyzed, either from pressure, or disease, or adhesions, or the lumen of the tube may be occluded from various causes, in either of which cases the opposite tube in a healthy condition may have the power to reach over and arrest the escaped ovule.

Tait¹⁰²⁸_{v.1,p.439} states that the uterus alone is the seat of normal conception. As soon as the ovum is affected by the spermatozoa it adheres to the mucous surface of the uterus. The function of the ciliated lining of the Fallopian tubes is to prevent spermatozoa from entering them and to facilitate the passage of the ovum into the proper nest. The plications and crypts of the mucous membrane retain the ovum there until it has become impregnated or dies and is discharged.

With these views it is easy to understand the cause of tubal pregnancy, for we have only to turn to the papers of Arthur Johnstone and Bland Sutton to see a desquamative salpingitis, and to at once put the mucous lining of the tube in a similar condition to that of the uterus, and in a condition in which the access of the spermatozoa would be possible, the retention of the ovum in the tube inevitable, and its immediate adhesion to the tube take place; after-impregnation would be as easy and as likely as its occurrence in the uterus. The cause, therefore, of ectopic gestation or tubal pregnancy will be, any process or accident which has reduced the Fallopian tube, so far as concerns its internal lining surface, to the same condition as that of the uterus.

Zinke says that if Tait's theory be true, ectopic gestation should not occur, for the following reasons: 1. Diseased tubes, which would facilitate the passage of the germ, imply a condition which renders the tube patulous throughout, in consequence of which the spermatozoa would obtain a ready entrance. 2. Tubes so affected would certainly as readily admit of the passage of an ovum, impregnated or otherwise, and these rather tend to prevent than to cause ectopic gestation. 3. Is it not much more reasonable to suppose that the disease present, or previously existing in the tubes, would have a tendency to destroy rather than to promote the life and union of the male and female elements?

When we consider the investigations of Haussmann and Nuck on the lower animals, in which it was demonstrated that the spermatozoa traveled through the genital tract to the ovaries; when we consider the well-authenticated cases in which it was proved that the spermatozoa brought in contact with the external genitalia, in case of unruptured hymen, traveled into the uterus, inducing impregnation, it does not seem reasonable to accept Tait's theory of the absolute point of fecundation of the ovum.

Landau²²_{July 23} mentions a case of ectopic gestation in a rudimentary cornu. The vagina opened into the normal cornu, but presented no direct communication with the rudimentary one. The sperm had apparently made its way through the uterus and right tube to the right ovary and then wandered to the left tube, which was completely shut off from the right cornu.

Lusk⁴⁰_{Oct.} says: "The ovum discharged from the ovary upon maturing of a Graafian follicle enters the Fallopian tube through

the influence of the current induced by the ciliated epithelium of the fimbria, is propelled through the tube by ciliated currents and by peristalsis of the tube, or by both combined; the latter propels the spermatozoa to the ovum."

Wyder reports a case of tubal gestation in which the uterine end of the tube contained ciliated epithelium, everywhere present.

According to Zinke, the causes as usually given are: 1. Shock and terror coinciding with time of fecundation. 2. Blows upon the abdomen shortly after fruitful coition. 3. Malformation of tube; paralysis or spasm of it; defective or excessively long tube; engorgement or swelling of its mucous membrane; hardening and retraction of the fimbriated extremity, as well as the obliteration of the tube within the uterus. 4. Inflammatory processes within the pelvic cavity and pressure upon the tube, created by swelling or morbid growth. 5. Desquamative salpingitis.

Symptomatology.—Illoway ²⁷_{Feb. 27} gives (a) the symptomatology from the outset of the period of labor; (b) the symptomatology after that period. At the outset, there is the consciousness of being pregnant, and in from four to ten weeks other symptoms, viz.: 1. Colicky pains in the hypogastrium, usually very violent, preventing standing erect or lying stretched out; skin cold and pale, and covered with a clammy perspiration; pulse small and thready, with occasional vomiting. The suffering may be so great as to produce syncope, often paroxysmal, lasting a few hours or a day, and then the restoration to health until another attack. These pains rarely occur before the first month and frequently not until after the fourth or fifth. 2. There may be, in addition, a fixed grinding pain in the iliac fossa extending down the thigh. Both forms of pain are more severe in the tubal variety. 3. Vaginal hæmorrhage, having a menstrual character, may occur at intervals or be continuous. We may have symptoms of abortion or supposed abortion, profuse hæmorrhage, with discharge of decidual mucous membrane. 4. Abdominal enlargement to one side, more common in the tubal varieties. 5. Deviation of the uterus from its normal position, occasioned by a tumor located on either side, in front or behind. 6. The tumor being recognized, careful examination shows that it is elastic and fluctuating, and ballottement

demonstrates the presence of a solid body within. 7. Vacuity of the uterus is shown by examination of the uterus with the sound.

Foerster¹⁵⁰_{Nov} directs attention to the premature activity of the mammary glands.

Course.—The fecundated ovum in ectopic gestation, in the majority of cases, develops in the tube. Tait points out that a clinical distinction of two kinds of tubal pregnancy must be made. “The first class, those cases in which the fertilized ovum develops in that portion of the tube which is free of uterine tissue; and, second, those which develop in the uterine portion and are called interstitial. The process of development in any part of the tube results in its rupture. In the interstitial cases the rupture invariably takes place into the peritoneal cavity, and occurs in from three to twenty weeks. Ectopic gestation, in the free portion, ruptures, usually not later than the fourteenth week. I have seen it rupture as early as the fourth week. This rupture is termed primary rupture, and constitutes one of the most disastrous accidents to which a woman can be subject.

The tubal rupture takes two directions: (*a*) into the peritoneum, which is the fatal form; and (*b*) into the cavity of the broad ligament, a form which yields the variety of ectopic gestation which I propose to call extra-peritoneal, which alone yields all the cases which go on to lithopædia, all the suppurating cysts discharging into the bladder, rectum, etc., and also the cases which, by secondary rupture of the ovum cyst, are called abdominal pregnancy.

Montgomery¹⁰²⁹ reports a case of rupture five weeks after last menstruation. Section. Two quarts of blood removed from the peritoneum. A cyst the size of a cherry in left tube had ruptured.

Hanks²⁷_{July} mentions an autopsy upon a woman dying from internal hæmorrhage; ovum did not appear to be over three weeks.

Bantock⁴⁹_{May} reports a case of tubal gestation going to sixth month without rupture. “The case proves that Tait was too dogmatic in asserting that a Fallopian pregnancy always ruptured at the thirteenth week.”

Thos. Chambers¹⁰⁰⁸_{Jan.} reports a case of extra-uterine pregnancy in which sac ruptured at full term of pregnancy. Patient survived without operation. She died four years later, a week after premature labor, from suppurative peritonitis.

Diagnosis.—The importance of early determination of ectopic gestation cannot be overestimated.

J. W. Taylor ²²_{May 7} finds the following to be the three signs of greatest service in forming a diagnosis at an early period: 1. Amenorrhœa, followed, after six or seven weeks, by irregular hæmorrhage. 2. Absence of any uterine enlargement. 3. Tubal tumor usually felt directly behind the uterus.

Geo. T. Harrison ⁵⁹_{June 14} adds the extrusion of the decidua, where that has occurred, and the peculiar softness of the pregnant tubal sac, indicated by Veit, which is not found in any other variety of tubal tumor. Tait ²²_{May 14} asserts that Taylor had not diagnosed ectopic gestation in either of his cases prior to rupture.

W. A. Briggs ¹⁴⁷_{Feb.} presents the following conclusions: 1. The diagnosis of early misplaced pregnancy is beset with considerable, but not insuperable, difficulty, and can ordinarily be made with positiveness. 2. The steps in diagnosis are the establishment (*a*) of pregnancy, (*b*) of the absence of the ovum from the uterine cavity, (*c*) of its presence in either Fallopian tube or the pelvic cavity.

Skene ¹⁰³⁰ believes in the possibility of the diagnosis of ectopic gestation before rupture, and asserts that it is as easy as any known affection of the female sexual organs. It is true that opportunity is seldom afforded for examination before rupture, but it is also true that patients generally defer consultation in cancer uteri until too late. Jaggard ¹⁰³⁰ coincides with Skene's views, and cites 10 cases in which diagnosis and operation had been made prior to rupture.

The frequent obscurity in diagnosis is well illustrated by the history of a case operated upon for pyosalpinx and reported by Baldy, ⁹_{Feb. 15} which calls the attention to the following points: 1. That it was an unruptured or primary tubal pregnancy (the second one he had had). 2. There was no missed or scanty menstrual period. 3. There was no decidual discharge. 4. There were no breast or stomach symptoms or other signs of pregnancy. 5. The woman did not think she was pregnant. 6. The uterus was of normal size. 7. The character of the pain was not markedly distinctive. 8. There was a tubal pregnancy on one side and an ovarian cyst on the other.

The case is cited as an additional illustration of the impossi-

bility of forming an accurate diagnosis in ectopic gestation, and of how such a condition can exist without showing enough symptoms to cause even a suspicion of its existence.

Mundé²⁷_{Jan.} reports a case which was supposed to be an ectopic gestation. The sound was several times introduced into the uterine cavity, showing that it was but slightly enlarged. Upon section it was found to be a part of the uterus. The liquor amnii was aspirated and the child left to nature. Abortion occurred and the patient recovered. She was found to have a bicornate uterus. Bache Emmet²⁷_{July} reports a case of supposed ectopic gestation, with ovum developing an inch from the horn of the uterus, in which, under repeated applications of galvanism, the sac and contents were forced into the uterus and subsequently thrown off. The non-existence of uterine pregnancy was inferred from the use of the sound. In the discussion, Wylie made the plausible suggestion that it was not impossible that this might have been an anomalous uterine pregnancy which had been interrupted by the introduction of the sound, and that the tubal swelling was due to some other condition.

H. C. Coe²⁷_{Jan.} relates a case which had been diagnosed as extra-uterine pregnancy. Electricity, both galvanic and faradic, had been applied. Section was done, and the condition found to be a normal pregnancy and the tumor which had been felt an enlarged and inflamed ovary.

Regarding the severe pain associated with partial or complete rupture of a tubal gestation, W. D. Hamilton¹_{Feb. 8} says that only four reasonable suppositions for the severe pain can be given, viz.: 1. Biliary colic. 2. Renal colic. 3. Gastric ulcer with perforation. 4. Tubal pregnancy with rupture.

In the first, pain would be accompanied with tenderness in the region of the stomach or gall-bladder; in the second, renal colic causes intense pain in the region of the loin, following the direction of the corresponding ureter, with tenderness upon pressure over the kidney of the affected side. The diagnosis will be further confirmed by sabulous matter or blood in the urine. Perforating ulcer will probably be preceded by suspiciously painful gastric symptoms.

Treatment.—C. A. L. Reed's⁶¹_{Nov. 29} conclusions are: 1. The only proper treatment of ectopic gestation is that by abdominal section,

2. The operation should be done in cases before rupture so soon as the condition can be presumptively diagnosed. 3. The operation should be done, in cases after rupture, as soon as the evidences of internal hæmorrhage become apparent. 4. In cases in which the viability has already been reached without rupture, pregnancy should be allowed to advance to term before operation, but only under the closest possible vigilance. 5. In all cases the appendages from both sides should be removed, providing the condition of the patient will justify the extension of the operation.

J. F. Harrison⁴⁰_{July} quotes Olshausen as follows: In the first months of an ectopic gestation, before rupture, if the diagnosis seems certain, laparotomy and extirpation of the fœtal sac are indicated. After rupture has occurred, during this period, operative intervention is indicated only when the phenomena assume a threatening character. If the first months of an ectopic gestation, with or without phenomena, have passed, and the ovum continues to grow, we should operate, and the sooner the better. In the second half of the pregnancy, whether the child be living or dead, and without regard to its viability, we should operate without delay, as delay brings more danger than the operation. If possible, the entire fœtal sac should be extirpated; if not, it should be sutured to the abdominal coverings and drained from above. Elytrotomy and drainage into the vagina should not be done. For the control of the dangerous hæmorrhage during the operation, rapid ligation of the spermatic and uterine arteries is recommended. In individually appropriate cases, the future must decide whether it is not better to leave the placenta and immediately close the abdomen.

Holmes¹⁸⁵_{May} says that, of the various methods of treatment, only two are worthy of consideration. They are destruction of the life of the fœtus by electricity or removal by abdominal section.

If the diagnosis seems tolerably certain before the twelfth week, and before rupture seems imminent, use electricity. If rupture occur, and symptoms indicate an arrest of hæmorrhage and rally from shock, wait for reaction and perform laparotomy. If symptoms point to a continuation of the bleeding, open the abdomen and control it in the only way possible,—that is, by ligating the vessels in the broad ligaments. If the fœtus be dead and its presence threatens danger, remove it at once.

Electrical Treatment.—A. Brothers²⁷_{Feb.} reports 53 cases of ectopic

gestation treated with electricity, with 4 deaths; subsequent health of patients good. He concludes that the risk of rupturing the sac of an extra-uterine pregnancy, causing death from internal hæmorrhage, is slight. In but one case has this occurred (Janvrin), but the reporter thought himself that the damage existed prior to the use of electricity. Suppuration of the dead foetal mass has not occurred in any case in which electricity was applied before the third month. Beyond the third, or possibly the fourth month, electricity should not be resorted to. Electro-puncture he condemns in all cases. In cases of mistaken diagnosis no harm was done by the electrical treatment. Under galvanism or faradism, early extra-uterine pregnancy can be checked in its growth, caused to disappear entirely, or to shrivel up. The remaining masses have, so far, caused his patients no subsequent trouble.

Buckmaster²⁷_{July} advocates electricity for ectopic gestation not only on account of the fatal termination of section, but because of the *sequelæ*, such as intestinal adhesion, hernia, and abscesses. The only place for section, besides arrest of hæmorrhage, is to afford a vent in case of septic involvement. The office of electricity is to destroy the life of the foetus before the third month.

While treatment in the earlier months by electricity for the destruction of the foetus has been ably advocated by Lusk, Skene, and others, it has been as ably opposed by Baldy, Tait, and others; first, because of the difficulty in determining the diagnosis of extra-uterine pregnancy before rupture of the sac; second, from the danger of the suppuration of the foetal sac; third, because the means are in many cases ineffectual to bring about the results desired.

Tait makes the following objections: 1. It is immoral to kill the foetus. 2. Its destruction affords no safety to the mother. 3. The means to bring it about are in themselves dangerous. 4. The means are ineffectual.

Buckmaster reports a case in which the foetus had resisted a current of 20 milliampères; another case, in which strong currents of galvanism and faradism had been used, and, later, a growing tubal pregnancy had been removed.

Maugh⁸⁵⁷_{Dec., '89} quotes the case of Duncan and Hicks as follows: "In this case the induced current, as strong as the faradic coil of a combined Coxeter battery could give, was first used. The positive

pole was placed over the abdomen and the negative in the vagina. The current was passed and withheld during spaces of two seconds for a minute and a half. Then the continuous current from a modified Leclanché cell was passed for six minutes, producing slight blistering of the skin and a dried surface in the vagina. Heart-sound audible. Next day 2 grains (0.13 gramme) of morphine were injected into the amniotic cavity, but the fœtus was not killed. Then the liquor amnii was drawn off through the abdominal wall by the aspirator. Eight ounces were removed, the heart-sounds being still audible. Two days after, $\frac{1}{4}$ grain (0.016 gramme) morphine was injected 2 inches deep into the body of the fœtus where the heart-sounds were best heard. This was twice repeated at intervals of two days without any result. Galvano-puncture was now tried. Two insulated electrolytic needles were passed $1\frac{1}{2}$ inches into the tumor and connected with the negative pole; positive pole to the abdomen. A current from 40 Leclanché cells was passed for six minutes, with some interruptions. After all, the fœtal heart was still beating, but more slowly. It continued to beat four days after this, when the tumor was again aspirated, and 13 minims (0.84 gramme) of equal parts of water and hypodermic solution of morphine was again injected over the fœtal heart. Heart-sounds ceased at last (wonderful!). Patient died two days afterward. Will any one again dare practice such butchery? And what becomes of killing the fœtus by electricity, and of Barnes's puncturing the sac, or of narcotic injections? If, to kill the fœtus in these cases, we have to kill the woman, could we not devise some less barbarous method? Say, cut her throat?

George T. Englemann²³_{May} says that he has been quoted as an advocate of electricity in the treatment of ectopic gestation, but late experience has led him to waver. Any other but surgical treatment endangers the life of the patient, as each day of delay must appear to be the loss of a golden opportunity.

Pozzi³_{July 16} emphasizes Werth's view that the ectopic fœtus must be regarded as a neoplasm, and measures taken for its extirpation. This treatment is hazardous in every period of its evolution. In the first period, danger of fatal hæmorrhage; in the second, danger of septicæmia and peritonitis; then danger of internal suppuration and compression after it has for a long time been transformed into an apparently inert mass. The question is a very simple one when

it resolves itself into a question of the opportunity to operate, and of the technique for the extirpation of the fœtus. One of the earliest and most threatening dangers that we have to consider is that of hæmorrhage after rupture. It has been said that rupture usually occurs in tubal pregnancy by the fourteenth week, the cases in which it does not being exceptional. Where rupture takes place into the peritoneal cavity, the patient may die in a few hours if operative interference is not undertaken.

Montgomery¹⁰³¹ reports a case of rupture at the fifth week, with grave symptoms of internal hæmorrhage. The abdomen was opened and 2 quarts of blood evacuated, the tube ligatured and removed. Patient recovered. He says that in such cases we shall often have to operate upon indications that cannot be accepted as positive evidence of the existence of the suspected condition. We operate to save life, not to confirm the diagnosis. The operation should be done at once, not waiting for the patient to rally from the shock. The opening of the abdomen and the securing the bleeding vessels is just as absolutely indicated as it would be in any other portion of the economy.

Pozzi says that in ectopic gestation after the fifth month, with child living, there has been much difference of opinion as to the manner of procedure, one class advocating the operation at a time to save both mother and child, the other impressed with the dread of operating during the life of the child on account of the danger of hæmorrhage from placental circulation. Under former methods of operating results were not especially encouraging. Werth collected 8 cases with 7 deaths; Harris, 30 cases, with 5 mothers saved and 6 children. Since Werth's report, Pozzi has collected 13 cases, with 9 mothers and 11 children surviving. This improvement in results was due to improved methods of technique, particularly in controlling hæmorrhage.

The advocates of delay await the death of the fœtus, saying that it is not worth considering,—that it is likely to be feeble, deformed, and short-lived. The time considered most favorable is six weeks to two months after fœtal death. A number of cases, however, show that the fœtal circulation is not always arrested, even after this time, and the arrest of hæmorrhage does not compensate for the increased danger from septicæmia and peritonitis. Cases of pregnancy in a rudimentary cornu, or horn, left to nature,

have given a mortality of 23 to 30 per cent. Bandl would make haste to interfere by abdominal section. It is much more simple than in the other forms of ectopic gestation. It has been done six times, at or shortly after full term, with 5 successes. The supplementary cornu has been removed, as in the Porro operation. A patient of Sanger has been confined three times after this operation.

Ssalawjew⁵³⁰_{No.7} suggests the name laparo-kelyphotomy where the fetal sac is opened, and laparo-kelyphectomy where the sac with its contents is removed. Stratz³¹⁷_{Nov.30} recommends the term ectopotomy for all sections of the abdomen for the relief of ectopic pregnancies. He considers the greatest danger to be from infection through the tube. He disinfects the portion of the sac remaining with a 10-per-cent. solution of chloride of zinc, and treats it intraperitoneally. Of 3 cases so treated 2 recovered. The occurrence of ectopic gestation in the tube after operations for this condition have been mentioned by Frommel, Veit, Winkel, Kletsch, Puech, Tait, and Montgomery.

McLean²⁷_{Jan.} asserts that ectopic gestation is very likely to be associated (either before or after) with placenta previa. He also reports²⁷_{Apr.} an operation performed at the twelfth month, three months after death of fetus at term. The patient was 24 years old, had had two normal labors, the last child 21 months old. In December, 1888, menses ceased, and she recognized pregnancy. She experienced no inconvenience until between the third and fourth month, when, after severe exposure to cold, she was taken with a violent pain in the right side, and was laid up for two or three weeks with "inflammation of the bowels." The patient was not well subsequently, suffering with pains of varying severity at frequent and irregular intervals. Early in September, 1889, she expected to be confined, from which time there was a slight, bloody, vaginal discharge, which increased the first part of October and November. Upon examination in the latter part of November, a large, round, tender, and fluctuating tumor was distinguished, filling up the right and central portions of the abdomen. No solid body could be distinguished, and intestinal resonance was marked at the epigastrium and in the flanks. In the left inguinal region, extending distinctly above Poupart's ligament, and very movable, was a second, pear-shaped tumor, about 2 inches in diameter.

This, upon investigation, was found to be the uterus. (See Fig. 1.) A hard, round tumor was found filling the pelvic canal, and pushing the uterus forward and to the left (Fig. 3). Operation December 5, 1889. Incision as in Fig. 1, P representing the site of the placenta, which was removed piecemeal, the fœtus weighing 7 $\frac{3}{4}$ pounds. The uterus was attached to the tumor by an isthmus, as seen in Fig. 2. The sac was everywhere adherent.

A drainage-tube was inserted into its cavity and the wound closed. The patient subsequently fully recovered.

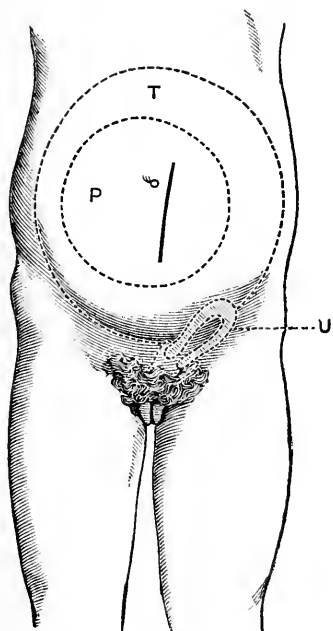


FIG. 1.



FIG. 2.

EXTRA-UTERINE PREGNANCY. (MCLEAN.)
(*American Journal of Obstetrics.*)

OVARITIS.

Petit ²⁴_{Oct. 6, Mar. 22} states that oöphoritis occurs under two principal forms,—the suppurative and the sclerotic. Abscesses of the ovary are almost always localized in the Graafian follicles, and may constitute one of the decided consequences of the puerperal state. Under long continuance they may prove to be a source of infection. Follicular cysts are the result of repeated congestion of the ovary, and may result in interstitial oöphoritis. These conditions need not be considered as indications for removal of the ovaries; at least, not until after a trial of palliative or expectant treatment. With regard to the mere evolution of the Graafian follicles, the following

points are submitted: 1. The existence of a subepithelium endothelioma is very questionable, the so-called lymphoid layer, when it exists at all, being in reality only a fibrillary layer, which is poor in cells, and is hardly to be distinguished from the external cellulovascular layer. 2. In the developing ovisac the intra-follicular cells, which have heretofore been regarded as a single layer of cells pressed against the proliferating wall, become cuboidal in shape and divided into two layers, which are sustained by two sets or systems of papillæ. One of these layers adheres to the ovule, while the other remains attached to the wall of the follicle. These papillæ remain after the ovisac has ruptured. Should they become fused, and the epithelium undergo hyaline degeneration, the corpus luteum would atrophy; but should they continue to live and grow, the corpus luteum would become hypertrophied. A knowledge of these details of normal histology is of great assistance in obtaining the histology of follicular cysts of the ovary, whether sanguineous or serous. Serous cysts result from a dropsy of the follicles or of the ovule. They may contain only a single layer of the cubical cells on the internal layer, or there may be two zones, the inner one resting upon a hyaline membrane which corresponds to the vitelline membrane.

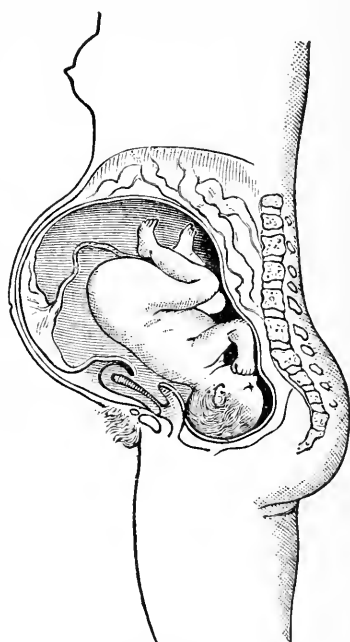


FIG. 3.—EXTRA-UTERINE PREGNANCY.
(MCLEAN.)
(*American Journal of Obstetrics.*)

The sanguineous cysts are of the following varieties: those which proceed from an exaggerated physiological hæmorrhage after the exit of the ovule; those which are due to hæmorrhage within the corpus luteum; those which result from primary intra-vascular hæmorrhage, and are not preceded by rupture of the ovisac; those which result from dropsy of the follicle and hæmorrhage; those which occur in cases in which the ovule is retained with the ovary.

Slaviansky ¹⁵⁴_{Feb. 15} divides ovaritis into parenchymatous, interstitial, and mixed.

Parenchymatous oöphoritis is generally acute, and ends in retrogression of the follicles. Interstitial oöphoritis is either diffused or localized in the perifollicular connective tissue. The first, the diffused form, is, in general, septic in origin, perhaps presenting the serous, hæmorrhagic, suppurative, and neurotic forms. In the second form, or circumscribed perifollicular oöphoritis, inflammation is less intense; it ends in the maturation of a large quantity of follicles, sometimes of all the cortical layer (*oöphorite folliculaire productive*), which has been wrongly described by English authors as small cystic degeneration, since this process has nothing to do with the production of cysts, and never ends in them. The affected follicles degenerate. Sometimes the perifollicular tissues become thickened—fibrous deviations—and form the small bodies visible to the naked eye on the surface of the ovary. Inflammation of a septic origin accompanies a large development of the connective tissue, and brings about cirrhosis of the ovary.

W. H. Byford⁸¹ says that acute inflammation of the ovaries, uncomplicated by inflammation in other tissues, is very uncommon. Chronic ovaritis is very much more frequent. It is sometimes difficult to determine whether the ovary or tube, or both, are inflamed. When we meet with chronic, incomplete inflammation of the ovary, it almost always manifests itself in such a way as to enable us to decide upon its existence with a good deal of certainty. It is usually the result of acute pelvic inflammation, something in the ovary causing the inflammation to linger longer than in the connective or serous tissue of the pelvic cavity. He divides the post-mortem signs of inflammation of the ovaries into a hyperæmia or a highly vascular state of the ovaries, in which redness is plainly shown; an enlarged state of the organ; a decided change in its follicles.

Imlach,¹⁸⁷_{Jan.} in the discussion of ovaritis and salpingitis, states that this term includes large, pale ovaries, following typhus and other fevers, tough upon section, and composed almost entirely of fibrous tissues, without Graafian follicles; also the corrugated, atrophic ovaries, with minor watery cysts. The tubes are thickened and distorted, but without fluid contents, except a little muco-pus. Sometimes small beads or masses are felt, which prove to be beads of inspissated pus or mucous epithelium. These organs may be carried into Douglas's pouch and held down by peritoneal adhesions

and a retroflected uterus, or they may be adherent to one side or other of the uterus or its fundus to the cæcum, vermiform appendix, or rectum. Chronic inflammation of the ovaries is sometimes difficult to determine, very frequently existing in conjunction with diseased conditions of the tubes; but it may exist independent of them.

A very interesting form of the disease, and one which has been but recently brought to the attention of the profession, is described by Mary A. Dixon Jones, ⁵⁹_{Sept. 6} which she calls "endothelioma of the ovary." She first saw the condition in 1885, when it was called alveolar sarcoma. The disease is invariably found accompanied by anomalous menstrual bodies, or gyromata, and is frequently an outgrowth, though gyromata exist in many cases generally where there is no trace of endothelioma. Both conditions result from inflammation, and both produce it. The endothelioma develops finally into a new form of red blood-corpuscles and blood-vessels, mostly of a capillary and venous nature, at last terminating in what is known as hæmatoma of the ovary. The anomalous menstrual bodies (gyromata) are the result of certain pathological changes in the follicular membrane,—the normal remains of menstruation. This membrane is a delicate, ribbon-like formation, structureless, highly refractive, thrown into graceful folds, and buried deep in the ovarian stroma. It has been found in the ovaries of women over 70 years of age. When subjected to pathological action it first becomes inflamed, broadens, the inflammation corpuscles begin to lengthen, gradually changing to fibroid tissues, and, in the meanwhile, a waxy, colloid substance is deposited in the membrane. As the morbid process advances, the complications increase in number, until, in some cases, large territories of the ovaries are transformed into hard, convoluted masses, and under high powers of the microscope neighboring tissues are found in a state of intense inflammation, or becoming waxy, or changing into endothelioma, or all three of these conditions are found co-existing. In some instances the gyromata form irregular walls, inclosing a varying amount of newly-formed myxomatous tissue; it is frequently found in a state of acute and subacute inflammation, and containing many newly-formed blood-vessels. Such grave pathological changes must necessarily be accompanied by pain and by more or less constitutional disturbance. Endothelioma is

frequently complicated by a varicose condition of vessels in its vicinity. Endothelioma is a serious disease on account of (1) local suffering; (2) the general ill health and indisposition it produces; (3) the dangerous condition of angeioma and hæmatoma; (4) the possible hæmorrhage, which may be fatal, or may be followed by fatal peritonitis; (5) the possibility of its suppurating.

What previous observers have termed corpora lutea vera, Jones says are nothing but anomalous menstrual bodies, or endothelioma changing to angeioma and hæmatoma.

Etiology.—Among the causes of oöphoritis, Slaviansky includes rheumatism, pertussis, and certain forms of angina. Tubercular oöphoritis is generally secondary.

Symptomatology.—Among the symptoms Slaviansky has observed a hyperæsthesia in the territory of the genito-crural nerve on the side of the diseased ovary. The ovary will be sensible to pressure, especially in the follicular oöphoritis; not sensitive in the cirrhotic, though spontaneous pain is experienced in the 2 cases. Hysteria is rare in oöphoritis.

W. H. Byford⁸¹_{Jan.} divides the symptoms into (1) local, (2) functional, and (3) reflex.

Local symptoms: pain in the neighborhood of the organ, and a shooting pain from the ovarian region upward and toward the spine, down through the limbs, and in the back. A most important one is pain confined to the ovarian region, or shooting in various directions from it to other parts.

The most important functional symptom is derangement of the menses. Thus we have an ovarian dysmenorrhœa, pain preceding, and at the time of menstruation, situated in the ovarian region and radiating to other parts of the pelvis; or pain may be present in the ovary between the times of menstruation, but more pronounced at the time. Should I judge from my own observation, I would say that the most frequent result of derangement, or ovarian disease, is suppression or partial suppression of menstruation. Entire suppression is not so frequent as a very great diminution of the flow. Another functional symptom is that of sterility. When the ovaries are in a state of chronic inflammation, the covering becomes so thickened and indurated that the ovaries do not discharge the ovum.

Under the head of reflex symptoms, there is not an organ in

the body whose functions are not more or less influenced by disease of the ovaries. It affects the whole of the abdominal organs, and consequently modifies nutrition, while dyspepsia and constipation are common symptoms. There is a deficient secretion in almost all of the secretory organs, from the reflex influence of the chronic inflammation of the ovaries to the great sympathetic or organic nervous system. This is why our patients are unable to eat, why they are so generally emaciated, so bloodless, and depressed. This condition is denominated a nervous condition, or neurasthenia. Hysteria is one of the effects produced upon the voluntary nervous system by chronic ovaritis. Then we may have epilepsy, arising from disease of the ovaries, perpetuated as long as the disease remains, and forming one of the most serious manifestations of reflex disease of ovarian inflammation. Another reflex influence is a tendency to mania or lunacy.

Imlach¹⁸⁷_{an} concludes, the bursting of Graafian follicles through the toughened and thickened capsule of a diseased ovary must be attended by severe pain. Hysteria is rarely found in women with diseased ovaries, and is not likely to be cured by their removal. Pelvic and reflected pains, inability to work or walk, menstrual irregularities, are all symptoms of ovaritis and salpingitis, and will be cured by the removal of the appendages. Anæmia has no direct relation to the disease unless chronic ovaritis be associated with myomata, when the menorrhagia will cause anæmia, which will be relieved by the removal of the ovaries. Anæmia may be due to infective pyosalpinx, or, if due to sleepless nights, to the use of gin and morphine to relieve pain, it will disappear after operation.

Courette²⁷⁶_{May 5} says that microcystic degeneration of the ovary constitutes a special type of chronic ovaritis. This affection may be primary, but it is more frequently consecutive to affections of the tubes, the uterus, or the broad ligaments. It is produced by repeated and chronic congestions of the ovary. The anatomical change begins almost always in the follicle, and produces the perfollicular zone of sclerosis in the parenchyma. The ovules raise and disappear. He has found endo-arteritis and peri-arteritis. The diagnosis is, perhaps, only made when the small cyst of the ovary is isolated, not adherent to the uterus, not surrounded by false membrane to render it inaccessible to the finger. The diag-

nosis is impossible when the cystic degeneration is accompanied by lesions of the tube with adhesions.

The writer has frequently seen severe pain in the mammary gland as a symptom of chronic inflammation of the ovary. The pain is usually felt with greatest intensity during the intervals of menstruation, and may entirely disappear during the flow. It is always experienced in the breast, corresponding to the ovary affected, and is so intense as to frequently lead the patient to fear that she is suffering from incipient malignant disease.

Diagnosis.—Slaviansky points out the augmentation of the volume of the ovary during menstruation as characteristic of follicular oöphoritis.

Goodell ⁹_{Nov. 29} says: "As headache does not necessarily mean brain disease, so ovary-ache does not mean ovary disease. Time and again have ladies been sent to my office to have their ovaries taken out; their ovaries were sound, but their nerves were not, and no operation was needed for their correction. So misleading, indeed, are the symptoms of a jaded brain and of other nerve-strains, under the uterine livery in which they are often clad, that I have known a jilted maiden to be treated by a cup and pessary, and a bereaved mother douched, tamponed, and cauterized for a twelve-month."

OVARIAN HÆMORRHAGE.

Rollin ⁴⁸_{Nov. ; Feb. 1} says that hæmorrhage from the ovary, apart from the physiological hæmorrhage which accompanies rupture of a Graafian follicle, is quite frequent. He considers two principal forms:—

1. Parenchymatous, or interstitial. 2. Vesicular. The latter may be divided into five varieties: (a) extra-vesicular, which may be so profuse as to cause retro-uterine hæmatocele, or even death, in a few hours or days; (b) intra-vesicular, in which the follicle is not ruptured; (c) slight hæmorrhage into the corpus luteum; (d) hæmorrhage into a dropsical follicle; (e) multiple vesicular hæmorrhage, in which several vesicles may become fused, as in certain infectious diseases.

Interstitial hæmorrhage may be very slight and almost insignificant, or so extensive that the ovary is converted into a pulpy mass resembling the tissue of the spleen.

VARICOSE OVARIAN VEINS.

Howard A. Kelly,^{764 Jan.} in a case of section for hysterorrhaphy, ligated large varicose ovarian veins, and suggested that this condition might be the cause of many cases of pelvic ache and pain.

HYDROCYSTIC OVARIES.

Cysts containing clear, watery fluid, apparently distended Graafian follicles, grow to the size of an orange, or less, and burst into the peritoneal cavity with pain. When they rise into the cavity the pain is occasional, when low down in the pelvis pain is constant. They may be mistaken for dermoid cysts, but search reveals their true character, and removal frees the patient from subsequent pain. The tubes are generally healthy.

In absent vagina three several conditions may exist: 1. Ovaries and uterus small; no pain and no need of any treatment. 2. Menstrual fluid retained in the uterine cavity or upper portion of the vagina; painful and requiring careful incision. 3. Hydrocystic ovaries; painful and requiring excision.

MYOMA.

Imlach^{187 Jan.} says that there are small fibroids which seldom leave the pelvis, or are no higher than the umbilicus, but produce a disabling effect upon the patient through hæmorrhage and pain. These growths are invariably associated with inflammatory disease of the appendages. Pyosalpinx is not uncommon and there is always advanced ovaritis. The tumor quickly subsides after the removal of the appendages.

OVARIAN HERNIA.

Thomas More Madden^{22 Sept. 3} thinks that ovarian herniæ are amongst the neglected, although clinically they should be amongst the most important, of the troubles that come before us in gynæcological practice. In the majority of cases they occur downward in Douglas's space, when the left ovary is the one most frequently displaced. Next, in point of frequency, the inguinal regions are the seat of the herniæ. They follow the course of the canal of Nuck, down and forward, and present in the labia. In the inguinal region these herniæ are generally confounded with enlarged glands or with tumors in the labia; in the pelvic region,

with abscesses and hæmatocœle; or, in a retroflexed fundus uteri, the patient may be treated for a non-existent retroflexion or retroversion of the uterus. The constant occurrence of the tumor, its physical character, the peculiar dull, sickening pain, and the extreme pain and nausea evident upon examination, should enable the physician to arrive at a correct diagnosis.

It is not an unfrequent thing for the displaced ovary to undergo cystic change in its abnormal position. When this takes place in the pelvis it may completely fill up the pelvis, and, as in a case which came under the observation of the writer, crowd the uterus upward, pressing against the neck of the bladder, interfering with the evacuation of the urine; and the pressure against the rectum is so great as to interfere with the passage of fæces. In this case death occurred shortly after she came under observation, from pressure of the mass.

Chénieux¹⁴_{May 25} reports a case of ovarian cyst in the right gluteal region which resembled a lipoma or an abscess. It was the result of a hernia of the ovary. Patient recovered rapidly after its removal.

S. S. Cartwright⁴⁰_{Apr.} removed an enlarged ovary from a hernial sac. The operation was begun for supposed inguinal hernia. A double inguinal hernia of the ovary cured by herniotomy and the sacrifice of the ovaries is reported by K. Parker.¹⁸⁷_{July} Routier³_{May 23} reports a case of cystic tumor of the buttock, which was opened under the supposition that it was an abscess, but was found to be the right ovary, which had formed an ischiatic hernia and had become cystic. The patient recovered after its removal.

TUBAL DISEASE.

Lucas-Championnière¹_{Mar. 22} thinks that the term salpingitis is not well chosen, for, in the majority of cases in which this disease is diagnosticated, disease of the tubes alone does not exist. In many cases both tubes and ovaries are simultaneously diseased, in others the disease is limited to the ovaries, and in still others neither the tubes nor ovaries are diseased, being in tissues adjacent to these organs. He combats the view that inflammation in puerperal disease extends from the mucous membrane of the uterus to that of the tubes, and says that such conditions are clearly referable to diseases of the lymphatics, and that these

vessels alone form a channel for the propagation of inflammation in the uterine annexa. This inflammation may cause tumors in Douglas's pouch, which have been variously named circum-uterine phlegmon, perimetritis, and pelvic cellulitis,—names signifying inflammatory products which after a time disappear to a greater or less extent. The swellings and lesions often found associated with the annexa of the uterus are of a very different character, and may arise from various causes. If from injury to the cervix, the first result would be disease of the contiguous lymphatics and progress to the uterine annexa. This would be a true salpingitis, and with it would be associated local peritonitis and the formation of intestinal adhesions, which in some cases would lead to intestinal obstruction.

I believe ⁸¹_{Jan.} that the terms pelvic cellulitis and pelvic peritonitis, para- and peri- metritis, peri-uterine inflammation, and pelvic abscesses, are misnomers, in that they define as separate pathological conditions what are simply stages of the same disease. A better term would be salpingo-ovaritis, as it describes the condition from which the others arise.

Etiology.—In the development of inflammatory disease of the Fallopian tubes, much credit has been given to the presence of specific inflammation, or gonorrhœa, as a cause. Schmidt ⁹⁵_{B. 25, II. 1} says that from observation in 116 cases he arrives at the following conclusions: That in only 27 cases was gonorrhœal salpingitis accompanied by peritonitis; from the frequent occurrence of the latter in complication with non-specific salpingitis, it seems that the number of women with gonorrhœa who have gonorrhœal affections of the tubes is relatively small. Gonorrhœa extends along the entire genital tract, generally within two months after infection. The accompanying pelvic peritonitis is due to the escape of pus through the ostium abdominale. This pus acts simply as a chemical irritant, and not by virtue of the contained gonococci. The fatal peritonitis which follows the rupture of a salpingitis is the result of a mixed infection.

J. M. Baldy ²⁰²_{June 25} denies the marked influence of gonorrhœa in tubal disease of women, and states that (1) the acute or subacute would soon cause a simple disease in the female, and consequently set up a specific pelvic inflammation; (2) the latent form of gonorrhœa, as taught by Saenger and others, is a myth; (3) by far

the most frequent cause of inflammatory disease in women is puerperal sepsis; (4) gonorrhœa is the cause of not more than one-fourth of these inflammatory processes in women.

Howard A. Kelly ⁸⁵⁸_{v. 2, Nos. 3, 4} presents a case of pyosalpinx in which careful investigation of its contents disclosed the presence of the gonococcus, and speaks of the importance of careful investigation of this condition in all cases to determine the origin of the disease.

Wertheim ⁸_{p. 476} has discovered the gonococcus in a number of cases of disease of the tubes. In every case where the abscess-sac had existed for a length of time, the gonococcus, somewhat altered in character, is found in the cellular tissue of the wall of the sac. While there are a very few who deny the influence of gonorrhœa in the development of disease of the tubes, yet there seems such a preponderating influence in favor of such origin for the tubal trouble that it seems wise to exercise every precaution to prevent the development of such condition.

Prochownik ³¹_{July 8} advocates the use of the galvanic current, with the positive pole in the uterus, in the treatment of gonorrhœa. Under the influence of this current, frequently applied, the micro-organisms are destroyed and the disease rapidly arrested, thus preventing the development of secondary trouble in the tubes.

Waldo ²⁷_{Mar.} says gonorrhœa does not always produce salpingitis. He has seen many cases of salpingitis in which the patient was unaware that anything was the matter. According to Bandl, pyosalpinx may be developed in two different ways: 1. By a chronic process, a hydrops tubæ, which is changed to pus by acute inflammation. 2. It can be rapidly produced by an acute process, and, furthermore, a catarrhal secretion is easily changed to pus by infection from a single examination, more especially by an intra-uterine one, when strict antisepsis is not resorted to.

The indiscriminate use of the sound is probably the cause of a great deal of pyosalpinx. Pyosalpinx does not necessarily follow salpingitis, but is apt to follow very acute endometritis from any cause. As a rule, the symptoms are aggravated at or near the monthly flow, and in many instances are increased midway between at irregular intervals. There are usually chilly sensations, with slight elevation of temperature.

Graily Hewitt ²²_{May 22} says the principal causes of tubular fluid accumulations are Fallopian pregnancy, rupture of cyst into the tube,

disease of the lining of the tube, giving rise to increased secretion of fluid derived from Graafian follicles or the peritoneal cavity, the fluid derived from the interior of the uterus. An important class of cases are those in which the cause is gonorrhœal inflammation, and, although the disease in the form of salpingitis is possibly not so common as it has been represented to be, no doubt it exists. Another (non-specific) cause of salpingitis is catarrhal affection of the tube, spreading upward from the uterus. While the part of the tube adjoining the uterus is the narrowest portion, it is, without doubt, normally sufficiently patulous to permit of the escape of the discharge through peristaltic action. Under occlusive pressure the complete retention would be a necessary consequence. Some of the causes of inflammation, specific or otherwise, whereby the mucous membrane is thickened, are severe displacement backward of the uterus, together with fixation of the organ by adhesions of the flattened, twisted, broad ligament. When fluid is discharged in gushes from the uterus, and the question arises whether such retained fluid is simply a retention *in utero*, or whether it is primarily, at all events, a retention in the tubes.

Pathological Changes.—Kümmell⁶⁹ June 5 says the cause of fluid collections in tubal disease is obliteration of the abdominal end of the tube through pelvic peritonitis, which is produced, generally, by catarrhal, tubercular, actinomycotic, syphilitic, and gonorrhœal disease of the tubes. The distended tubal sac can attain to the size of a child's head.

Hæmatosalpinx is often treated as a not positively determined tubal pregnancy, but occasionally for an appearance of blood in the distended and otherwise closed tube at either end. The disease is a far more frequent one than is in general supposed, and presents itself in the form of perimetritis, which, in most cases, is the companion of salpingitis.

Symptomatology.—The same author says that a frequent symptom of tubal disease is sterility, and another dysmenorrhœa, which often has the characteristic rhythm of labor-like pains, induced by contraction of the tubes.

Varieties—Hydrosalpinx.—In a typical case, in which the tubes were filled with a watery serum, the pain was so wearing that the patient was willing and eager for any chance of relief. The disease occurs between 30 and 45 years of age, and is impossible to

diagnose from pyosalpinx, previous to operation. The condition continues indefinitely, and completely cripples the woman until operation gives relief. The ovaries are usually atrophied, and should also be removed (Imlach). In speaking of ovarian abscess and pyosalpinx, he says that the former is less common. When the tubes are distended with pus, ovaries frequently atrophy, but ovarian abscess without pyosalpinx is rare and probably septicæmic. He has seen pyosalpinx of one side, the patient becoming pregnant and dying after parturition from so-called puerperal fever.

Grigg has observed 6 fatal cases of puerperal disease, with inflammatory disease of the appendages. In chronic ovarian abscess the ovary is never very large, and its cavity contains from $\frac{1}{2}$ drachm to $\frac{1}{2}$ ounce (1.94 to 15.55 grammes) of pus. In pyosalpinx both tubes may be greatly distended, or there may be only a little muco-pus. Pyosalpinx causes most suffering in young and otherwise robust women. He can reasonably assert the gonorrhœal origin in 50 per cent. of his cases. It occurs but rarely in virgins, and is then probably tuberculous in origin.

Hydrops Tubæ Profluens.—Schramm²_{May 10} describes a patient who had contracted gonorrhœa a year before operation. Menses were perfectly regular and accompanied by copious watery discharges, which relieved the patient of severe remittent pains to which she had been subjected between the periods. A swelling the size of a fist grew smaller at the end of each period, and at one time disappeared altogether. Tubo-ovarian cyst was diagnosed and found at operation. Health was subsequently improved.

W. M. Polk²⁷_{June} reports a case of double pyosalpinx. One tube, with ovary, was removed and the other torn up from its adhesions and left. Six months later he did Alexander's operation for retroversion. The patient has since become pregnant. This case is of interest as contradicting the assertion which has been made that a patient cannot become pregnant after having had an attack of double pyosalpinx.

Carcinoma of the Tube.—Von Schede⁶⁹_{June 6} mentions a patient, 48 years of age, who presented a case of swelling occasioning difficulty in emptying the bladder. The vagina was pushed forward, and under anæsthesia a tumor without a pedicle was found. This tumor was apparently a soft fibroid. As extirpation was

impossible, Kraske's method was employed. This consists in the removal of the coccyx, reaching the tumor on the right and behind the rectum. The tumor arose from one uterine horn. The ovary was present and was adherent to the degenerated tube, which was filled with blood and parts of the tumor-mass. The operation was very bloody. After two days death took place from collapse, without peritonitis. Microscopical examination showed the mass to be cancerous, and autopsy showed the cancer limited to the tube, proving it to be a case of tubal carcinoma.

Diagnosis of Tubal Carcinoma.—Kümmell,⁶⁹ June 6, says that the diagnosis is often not easy to fix, and depends upon the symptoms of sterility, periodical appearance of abdominal pain, dysmenorrhœa, and profuse and irregular menstruation. Further on, there is a striking exacerbation of profuse perimetritis, produced by the entrance of pus from the tubal end into the peritoneum.

Alban Doran,² Dec. 14, '89 dwells on the frequency of the closure of the ostium and tube in salpingitis, but the obstruction is often temporary. In adherent perimetritis the fimbriæ of the tubes are bound down by bands, which obstruct the ostium. In salpingitis the ostium is obstructed incompletely at first by the swelling of the mucous membrane which involved the fimbria, but permanently, in 2 cases, by great infiltration of the submucous tissue and middle coat, which swelled over the ostium and covered it in.

Imlach,¹⁸⁷ Jan. refers particularly to the tendency to the development of hæmatocele, and divides his cases of this disease into three divisions: 1. Cases of pyosalpinx with tubal ulceration and copious hæmorrhage in the tube and abdominal cavity. 2. Cases of undoubted tubal pregnancy, with rupture and hæmorrhage. 3. Cases of inferred tubal pregnancy, with disintegration of the fœtus and placenta, rupture, and hæmorrhage.

Veit,³⁹³ H. 2; May 5 speaks of the difference between pyosalpinx and pelvic abscess. Abscess in the tube is slower in its formation, and the general symptoms previous to rupture are less marked; the walls are thicker than in an ordinary abscess-cavity, and do not collapse after the pus is evacuated. Air enters the tube, its contents become more septic, and the accompanying perimetritis increases. Spontaneous healing is only obtained by prolonged drainage and the use of astringent applications to the sac.

That diagnosis is by no means easy, even in apparently simple

cases, is rendered evident by the case reported by Doléris,¹⁶² ⁵ in which, by vaginal examination, he detected what seemed to be an undoubted pyosalpinx in Douglas's pouch. He opened the abdomen and found an adherent coil of intestine. He has made the same mistake twice before, and does not see how it can be avoided.

Elongation of the Tubes.—Fedorenko,⁶ ^{July 19} remarks upon the length of the Fallopian tubes when associated with cystic disease of the ovaries. The tubes are sometimes stretched to 40 centimetres, and, in a case of Breisky's, to 58 centimetres, the normal length, according to Scanzoni, being from 25 to 30 centimetres.

TREATMENT OF DISEASES OF THE OVARIES AND TUBES.

The diseases of the ovaries and tubes are so closely related, often rendering it difficult to absolutely determine, in an individual case, which set of organs is responsible for the symptoms and physical signs presenting, that it has seemed preferable to consider the treatment of both together, particularly when we consider that the treatment of one is, to a great extent, a repetition of that prescribed for the other affection. The function of the one set of organs is so dependent upon the performance of the other that grave disease of either leads to the functional destruction of both.

Medical Treatment.—Freund,¹¹⁶ ⁷⁸⁶ ^{Nov., '89; Feb.} commends codeine in all forms of ovarian pain, whether from prolapse, ovaritis, peri-ovaritis, or neuralgia. The relief obtained from the remedy was prompt and more or less permanent, even when small doses were given. No disagreeable results followed its use, as it does not stupefy, diminish the appetite, nor constipate. Dose, $\frac{1}{2}$ grain (0.032 gramme), in pill form, three times daily.

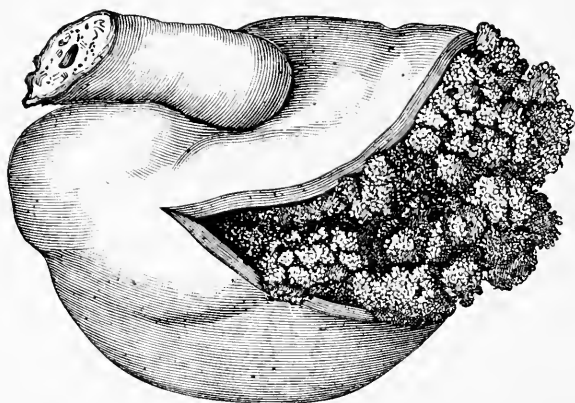
Slaviansky,¹⁵¹ ^{Feb. 15} has observed the best results from Moyer's pessaries; iodide of potassium, internally and externally; hot vaginal douches; massage, with 40 to 75 *séances*, during two or three months, under which the ovaries augment in volume and the pain ceases. In the severe hæmorrhage accompanying endometritis, curetting the uterus seems to have a favorable effect upon the disease of the ovary. Electricity (positive pole in the uterus), 75 to 100 millampères, gives excellent results. Sometimes a single *séance* gives the same favorable check as after curetting.

Surgical Treatment.—The cases which resist all treatment

are susceptible to surgical measures,—castration,—but this should be done as a last resort. Tait^{26 Feb.} had a case which continued to bleed after curetting the uterus. Removal of the appendages showed the ovaries full of cysts.

The reflex influence of ovarian and tubal disease upon the general health of the patient is very pronounced, often leading to a continued state of invalidism. The presence of an accumulation of pus in the tubes is a source of constant danger and necessitates radical measures for its removal. Notwithstanding the fact that the functions of these organs may be absolutely destroyed, so far as a reproduction is concerned, by the presence of these diseased conditions, there is still, however, a hesitancy on the part of the profession against advising the sacrifice of the organs, so long as it is possible to render the patient safe or give her relief. Polk voices this when he says that he regards the functional activity of the sexual organs in women of so great importance that he has come to do a great many things to spare the appendages if the woman is under 35 years of age. The opponents of the sacrifice of the tubes have placed their dependence largely upon the beneficial influence of the use of electricity. Goelet^{23 Feb.} advises the use of vaginal bipolar faradization, from the long, fine wire or current by tension, in acute stages of disease of the appendages. In subacute stages he urges it still more emphatically, as being capable of relieving the harassing pain. Applications should be at first vaginal, daily from fifteen to twenty-five minutes; when all that is accomplished that can be, the intra-uterine electrode is used. As the disease becomes chronic, the treatment must be re-inforced by intra-uterine galvanization once or twice a week, 20 to 30 milliampères for three or four minutes. In the chronic stage and *sequelæ* he used the constant or galvanic current, which must be increased progressively. The positive pole is always the choice when any degree of inflammation exists, because it is less exciting and irritating than the other, and exercises a more sedative influence. Beginning with the 20 to 40 milliampères, with bare platinum electrode so arranged as to affect the whole uterine canal from os to fundus, the first *séance* should last from three to five minutes and be repeated every other day, with the current gradually increased to 50, 100, or 150 milliampères. When used with high intensity the application should be but once or twice a week.

The advocates of electricity, however, acknowledge the futility of this agent in cases in which pus is present, and consent to the necessity of operative interference in such cases. The avoidance of the necessity of sacrifice of these organs is suggested by some who would relieve the condition by catheterization of Fallopian tubes through the uterus. Harvey⁵⁶_{Feb.} suggests that in many cases of pyosalpinx they can be treated by catheterization through the uterus and the application of a 60-grain (3.89 grammes) solution of nitrate of silver to the affected tubal cavity. Gottschalk³¹⁷_{Feb.}⁶¹_{p. 766, '89; Dec. 14, '89} regards favorably Walton's method of treating pyosalpinx by uterine dilatation and drainage where the collections of pus are in tubes with thickened walls. He dilates the uterus with iodo-



DOLÉRIS'S TUBAL PAPILLOMA.
(*Journal de Médecine de Paris.*)

form gauze, which is finally packed into the cornu of the affected side. This is repeated several times, and then the tampon is permitted to remain for three days. When pus begins to flow, the cavity should be kept loosely packed. Where this plan is not successful he uses the curette. Doléris²⁴_{Feb. 23} reports a case of vegetating tumor of the tube,—papilloma with endosalpingitis. The patient had suffered for a number of months with a growth in the pelvis something larger than an orange. This growth would decrease in size, at times, when there would be a discharge of sero-sanguinolent fluid through the uterus. The accompanying cut represents the growth reduced to one-fourth natural size.

He says this growth is so rare that there is not, to his knowledge, another specimen in France. The phenomenon of

periodical hydrorrhœa of the original tube, notwithstanding that the uterine orifice of the tube could not be perceived, was produced by its being filled up with a piece of papilloma capable of permitting a syrupy liquid to filter through and empty the tumor. The vegetative nature of the tumor is not absolute proof of its malignity, and in this respect the structure of the epithelial layer of the buds is of value, apart from that of excessive vegetation. The fact that the intra-uterine discharge is therapeutic is nothing very surprising. It is an observation which, taken as a precedent, is a proof of a negative order of the idea before defined of the reality of therapeutic intra-uterine dilatation, cleansing, and drainage of the uterus available for the recovery of a certain number of tubal and tubo-ovarian affections. This therapeutic discharge also may be the cause of a revision of diagnosis. The discharge in this case served to determine the curable from the incurable lesions, and the substitution, as a last resort, of laparotomy instead of a palliative process, which would have answered in other cases.

Salpingostomy.—Skutsch, Nov. 30, '89 instead of sacrificing the tubes, makes an opening of 1 square centimetre in size in the outer end of each tube and sews the mucous and serous surfaces together by fine silk sutures. This operation he calls salpingostomy. In cases of pyosalpinx he advises sewing the end of the tubes to the abdominal wound, opening them and allowing them to discharge the pus externally. When this ceases to be purulent they may be separated and dropped back into the abdominal cavity.

Nomenclature.—The method of procedure that is most usually practiced for the relief of diseased conditions involving the functional destruction of the tubes and ovaries has been their removal. This may be practiced by section through the abdominal walls or through the vagina. The former method is the one more usually practiced, and it is more desirable in cases in which there is extensive inflammation, with peritoneal and visceral adhesions. As a general term, comprising this operation and others of a similar character, we have usually accepted the name, "laparotomy." This term, however, has been objected to from a number of quarters, from the fact that it conveys a false idea of the actual operation performed. The term "laparotomy" would mean an incision in the flank, while it is recognized that the method of

procedure is performed through the median line. Tait⁵⁹_{May 30} prefers the name, "abdominal section." S. S. Todd¹⁰²_{Mar.} suggests "ventrotomy." R. P. Harris¹⁰³³ carefully reviewed the literature of the operation, and shows that the term "laparotomy" was introduced to the profession by a German student, without any reference to the actual derivation of the word, and demonstrates, from study of language, that the proper term would be "coeliotomy."

Removal of Appendages.—Joseph Price,²³_{Dec., '89} in a careful and thorough discussion of the subject of tubal and ovarian diseases, says: "There is only one rational treatment for pus anywhere in the body: remove it and its cause. Electricity has no place here. Vaginal drainage is insufficient, if for no other reason than the fact that pus in the pelvis is rarely contained in one sac, and this alone is enough to condemn it. Abdominal section is here the ideal operation, for, not only can the pus be evacuated thoroughly and completely, but the abscess-cavity with its pyogenic membrane can be extirpated. Short anæsthesia, short incisions, rapid enucleation of the diseased tissues, copious floodings of the peritoneal cavity, carefully-placed drainage, and accurate closure of the incision, will give the quickest relief and shortest recovery, and, as far as the disease is concerned, absolute cure; and for these reasons is the least dangerous."

Waldo²⁷_{Mar.} believes that where one tube only is distended with pus both should be removed if laparotomy be performed, for the well tube will almost invariably become diseased. Lewers²_{Feb., '22} considers the following cases suitable for the removal of appendages: 1. When palliative treatment has been fairly tried and failed. 2. When the physical signs are well marked. 3. When the patients themselves are anxious for operation.

E. E. Montgomery⁶¹_{Feb. 1} doubts the efficacy of the removal of the appendages in epilepsy and mania, unless we can trace their origin by progress and close association with the performance of their functions. He says it is not to the credit of our humanity that a poor woman, bereft of her intelligence, should be obliged to undergo the danger and discomfort of an operation of doubtful utility. The inflammatory adhesions, the complex destructions of the functions, and the reflex phenomena arising from the diseased condition, make removal of the appendages advisable in the majority of cases of hydro- and hæmato- salpinx. In conclusion, he

urges that the operation for the removal of the appendages should be promptly performed in every case in which it is evident that relief cannot otherwise be secured. It should be considered as a *dernier ressort* where there is a hopeful prospect of restoration to health by less dangerous methods, or without the sacrifice of the reproductive function. Its consideration should be dismissed in every case capable of restoration to health by other plans of treatment.

W. Balls Headly^{1000 Jan.} divides diseased conditions of the ovaries and tubes into: 1. Progressive ovarian cystic degeneration. 2. Other abnormal conditions of the ovaries and Fallopian tubes. He would urge immediate operation in the former, for the reasons that the operation in the earlier periods is almost without danger; that the nature of the disease, being progressive, removal will be ultimately compulsory; that complications in the course of its development are liable to occur which greatly enhance the subsequent risk to life, whether uninterfered with or in the operation.

In conclusion, he says: "1. That in the earlier or more chronic stages, the rule may be that the removal is desirable when a woman can no longer perform the functions of her life, or when attacks of local peritonitis are frequent, or where such an attack is of considerable duration. 2. That in the stages of blood poisoning from absorption or presence of pus without pelvic cellulitis or previous rupture into the intestine, removal is essential. 3. That in the late conditions, with pelvic cellulitis or rupture into the intestine, such operation should be only entered upon as an alternative to the anticipation of death, but should be performed then as early as such fatal termination seems positive.

Emmet^{59 Dec. 28, '99} says that Tait's operation is a valuable procedure, but very much more limited in its application than its author would have us believe. He has seen but 3 cases in which he felt it was justifiable, and has cured many cases, who have subsequently borne children, where competent followers of Tait had given an adverse prognosis unless operation was done. Many of these cases may remain sterile from closed tubes, but not one of them has been the victim of insanity or melancholia. Those who operate should keep a record of their cases. Many have had their sufferings aggravated by peritoneal adhesions. C. C. Lee^{1 Apr. 12} has never seen a case of epilepsy or hystero-epilepsy, or any of the neurotic

affections, cured by removal of the appendages. Purely neuralgic, or this with dysmenorrhœa, would seem to have improved. Benefit has been, for the most part, fitful and uncertain, and less than he had hoped to obtain by the forcing of the menopause. In salpingitis or tubal pregnancy, chronic ovaritis, and ovarian cysts, laparotomy afforded the only chance for restoration to health.

Osteomalacia.—The removal of the appendages has been recommended for conditions independent of the diseases of these organs, where it is deemed desirable to bring about a cessation of the menstruation. This was early recognized in the treatment of uterine fibroids. It has been suggested by Schauta⁸⁴_{May 10} as a measure for the relief of osteomalacia. He has recorded 8 cases of its successful performance. Hoffa²²_{May 7} reports a case of osteomalacia cured by removal of the ovaries. He is of Fibling's opinion that, when the disease is progressive, and in the child-bearing period, the removal of the ovaries is demanded.

Results.—Kepplar⁵⁷_{Oct. 5}, ⁷⁶⁰_{Oct. 18} says that he has removed the ovaries in 46 women. He obtained 39 complete cures, of which, in the greater number, results were followed for a number of years. The following are the principal physiological conclusions arrived at: 1. After the operation performed for a salpingitis or an inflammatory process, there has never followed a flow of blood from the uterus. 2. The conjugate diameter has become progressively shortened, and more especially so when the woman was young. This shortening may reach 3 centimetres. 3. The uterus has gradually diminished in volume from 8 centimetres to 2 centimetres (in the course of years). The vagina is much shorter, more narrow, and its mucous membrane has become more pale and the labia majora more slender. 4. The breasts have become atrophied, and resemble those of a man. 5. The pigmentation of the nipples, of the perineum, and the anus has disappeared, as well as the pathological pigmentation (chloasma). The skin has become of a remarkable whiteness. 6. The tendency to general *embonpoint* has not increased. 7. There has been no modification in either the hair or the voice. 8. The sexual appetite has remained the same, and is, if anything, more marked in those cases in which the operation has been performed near the appearance of menstruation. 9. The operation is no obstacle to marriage. Three of his patients have married happily some years since. 10. Marriage with a cas-

trated woman is the ideal Malthusian union,—the only method of applying to the letter the doctrine of Malthus without placing in danger the health and happiness of those interested. 11. In those women operated upon during youth for inflammatory affections, we did not notice, as a result, those numerous troubles which we frequently find in women operated upon for uterine fibroids at a more advanced age. 12. Hæmorrhage due to uterine fibroids is favorably influenced by castration, but the menopause never follows immediately. 13. Women operated upon for uterine fibroids, when well advanced in life, have completely lost their sexual appetite.

Hæmorrhage.—Lawson Tait, ²⁶_{Feb.} in hæmorrhage after enucleation of tubal pyosalpinx, pressed a sponge, soaked in a solution of perchloride of iron, upon the bleeding surface, and when it still continued he explored the pelvis with speculum and reflector, and, finding a bleeding from behind the uterus, rubbed in solid perchloride of iron and used drainage. Patient recovered.

Tito Spannocchi ⁴¹_{Feb. 27} has collected 87 cases of removal of the appendages for serious hysteroneuroses, and presents the following conclusions:—

“There are grave causes of hysteria which arise from irritation of the ovary, which one must separate from the uterine form as ovarian. Although the difficulty is very significant in obtaining an exact diagnosis in the ovarian form, it is still better sometimes to attempt it. In such difficult forms of ovarian histology, where every plan of treatment is of no avail, and threaten the existence of the patient, oöphorectomy is indicated. The operation, under the progress of antiseptic surgery, should no more be considered as very dangerous, but one which, if not always required, is still useful, and necessarily justifiable. Seventeen years’ observation and statistics prove that the results of oöphorectomy and salpingo-oöphorectomy, in those cases in which the indications were established and rational, have almost constantly reached the expectation of the surgeon.”

The influence of the ablation of the appendages upon the animal economy has been carefully studied by F. Weizmann and A. Reismann ¹³_{Aug.} in experiments upon sexually mature and immature dogs, and particularly upon the development of the sexual organs. The animals were killed at the end of four months, and their

organs subjected to microscopical examination. The result is as follows: In the tube and uterus, the external cylinder epithelium is defective; the lumen is, above all, narrowed; the mucous membrane strikingly atrophied; the glands have in many places completely vanished; in other words, become indiscernible. The protoplasm of the muscle-cells is strikingly diminished, and principally shows significant diminution in blood- and lymph- vessels. In animals not sexually mature these changes are present to a marked degree. The alterations in the vagina are less significant, in the vulva scarcely recognized. In one-sided operations the changes were limited to the tube corresponding to the ovary removed.

Abuse of Castration.—Pichevin,³¹_{June 19} condemns the abuse of castration in the female, and, in conclusion, says:—

“The alterations, peritoneal bands, small ovarian cysts, or simulated cirrhotic state which are encountered often, either as a cause of laparotomy or indications for examination, can never justify the removal of both ovaries. A precise diagnosis in affections of the ovaries and tubes, often very difficult, is of absolute necessity for ablation of the appendages, and, rather than resort to this mode of intervention where it is a mistake, a wise and patient conservatism is the more sensible therapeutics. Such a surgical procedure is not legitimate for metrorrhagia of unknown cause, dysmenorrhœal troubles, and, above all, hysteria, hystero-epilepsy, epilepsy, mania, and insanity. As regards masturbation, nymphomania, and morphinomania, it is the insane operation. Besides, castration does not always bring about the cessation of menstruation and the arrest of hæmorrhage, although done with antiseptic precautions. It endangers life, especially in nervous women. Even in cases where it is well indicated, it is generally difficult and sometimes impossible to perform.”

J. F. W. Ross³⁹_{Nov. 17} protests against the removal of appendages for pain, and the removal of the second ovary when but one is diseased. He says the removal of both ovaries produces a profound change; the removal of one, none. Neither the ovaries nor the tubes, nor large plexus of nerves in the broad ligament, described by Frankenhauser, exert the whole or sole influence that produces menstruation, as the case of Tait proves, where a supra-vaginal utero-ovaro-tubal amputation was performed, and, though

but a small stump was left, she continued to menstruate from it. He quotes the ingenious theory of Gnale, of Zurich, that the cells of all organs preserve a certain intimate connection with one another, a connection which first occurred during embryo life; that is, certain cells of the blood, of the nerves, of the glands, of the connective tissue, etc., correspond with one another because formed at the same period of time and bound together by certain prevailing structural changes. In the ovaries and uterus every cell corresponds to a certain number of cells in the blood, in the nervous system, etc., that belong to the same litter; that is, were developed at the same period of embryo life. When the ovaries are removed these corresponding cells remain behind and give rise to certain sensations and phenomena that previously existed. This theory explains neuralgic pains that occur in a limb that has been amputated, and, hence, many cases in which the ovaries are removed to relieve certain nervous symptoms which remain unrelieved. He believes that the tubes often have more to do in producing unpleasant symptoms than the ovaries, and there is no reason why they should not be removed and the ovaries left.

Omental Grafts.—In extensive denudations of the intestines, J. G. Carpenter ²²⁴_{June 7} directs attention to the importance of the following aphorisms from Senn: 1. Diffinitive healing of the intestinal wound has only initiated the formation of a net-work of new vessels in the product of tissue proliferation from the approximated serous surfaces. 2. Under favorable circumstances, quite firm adhesions are formed within the peritoneal surfaces in from six to twelve hours, which effectively resist the pressure from within outward. 3. Scarification of the peritoneum at the site of coaptation hastens the formation of adhesions and the diffinitive healing of the wound. 4. Omental grafts, from 1 to 2 inches in width, and sufficiently long to encircle the bowel, retain their vitality and become firmly adherent in from twelve to eighteen hours, and are freely supplied with blood-vessels in from eighteen to forty-eight hours.

Omental grafting should be done in every circular resection or suturing of large wounds of the stomach or intestines, as this procedure favors the healing of the visceral wound and affords an additional protection against perforation.

Menstruation After Removal of the Appendages.—J. A. Rob-

ertson ²_{Sept. 20} reports the removal of both ovaries in a patient, and subsequent menstruation and conception. He says this interesting case teaches several things, viz.: 1. The truth of Lawson Tait's teachings in regard to the starting-point of menstruation, namely, that the ovaries are not the cause of it. In this case the diseased ovaries prevented it, and after they were removed normal menstruation followed. 2. The possibility of vicarious menstruation. The woman had brought up blood daily for months; this ceased after the removal of the ovaries,—that is, after normal menstruation became possible,—and it has not recurred. 3. The proof that the removal of both ovaries does not render a woman impotent. I was not aware of leaving any ovarian tissue; indeed, I aimed to extirpate the ovaries thoroughly, and I thought I had done so. I suspect, however, that small portions of the ovarian tissue had reached up beyond the hilus of the right ovary, and that this may have taken on regular ovarian functions. 4. That in performing double oöphorectomy, except in case of uterine fibroid, any apparently healthy portion may be left.

The supposition with regard to the ovarian tissue remaining was the probable explanation of the subsequent menstruation and conception; certainly, conception could not have occurred had all ovarian tissue been removed; and the infrequency of menstruation after careful and thorough removal of the ovaries renders it exceedingly doubtful whether it ever occurs when these organs are entirely extirpated.

Geo. J. Engelmann ²³_{Apr.} protests against the grouping together of all cases of bleeding, after removal of both ovaries, under the head of menstruation. He says: "We have, first of all, bleeding that occurs during and after the operation, with more or less regularity, gradually diminishing and ceasing entirely after a few months, or, less often, after a few years. Then, again, there is a class of cases in which a period of quiescence follows the removal of the ovaries; but a bleeding, called menstruation by some, appears after three to six months, recurring at intervals of three or four weeks, with perhaps a severe attack of flooding now and then, but ceases in the course of a year or two,—a condition resembling the frequently-prolonged period of change of life. The peculiar bleedings seen after operation are explained by irritation or disturbance in the circulation through the cutting out of im-

portant circles, or by the lingering activity of ovarian remnants, which are gradually destroyed either by absorption or by imbedding in inflammatory deposits.

The third ovary, which has served to explain many of the peculiar phenomena, is so rare as to render it improbable. The truth is, in those cases, it is the remnant of ovarian stroma left in the pedicle, however small, which continues its activity and determines the following menstruation or conception, in health, and the suffering generally referred to the ovary, in disease. These particles may survive, or they may be destroyed by subsequent inflammation or necrotic disintegration, or be absorbed in the process of retrograde metamorphosis. Wherever it is possible to completely remove all ovarian tissue, menstruation ceases and the continuance of the aggravating symptoms is not likely to be found. From these cases the following conclusions may be drawn: 1. That the continued menstruation after the removal of both ovaries is due to remnants of ovarian stroma left *in situ*. 2. If particles of ovarian tissue, however small, which remain after the removal of the greater portion of the organ, whether or not the Fallopian tube be preserved, may retain their activity and continue the functions of the entire organ, we infer that the menstruation is more or less intimately associated with ovulation, and that the menstrual condition represents the ovarian status, provided the uterine tissues be normal in character. 3. That even elongated pedicles may contain ovarian stroma in which the functional activity of the organ may be continued. 4. That remains of ovarian stroma do not necessarily preserve their vitality and functional activity. 5. That the ovary is an essential factor in the functional life of woman, and that menstruation is inseparable from ovarian activity, if not ovulation.

The operator may obtain the following deductions: If menstruation is to be checked and the change of life produced, it is requisite that every particle of ovarian stroma shall be removed, if the result desired be expected with certainty. If shrinkage of fibroids, limitation of hæmorrhage, or cessation of annoying symptoms are to be accomplished, with the greatest possible certainty, both ovaries must be completely removed. In the performance of double ovariectomy, in women not yet beyond the climacteric, and not suffering from uterine reflexes, such healthy ovarian tissue as

may exist should be spared, in order that functional activity may not be impaired.

Foreign Bodies in Douglas's Pouch.—Williams, ³⁶_{Apr.} in operating for a case of pyosalpinx, found a hair-pin in Douglas's pouch. It was supposed that it had been introduced into the uterus with a view of inducing abortion, and had passed through it and into the Fallopian tubes, setting up an abscess which had perforated the sac.

OVARIAN CYSTS AND TUMORS.

Causes.—H. Gibbes ⁹⁹_{Aug. 7} says pathological changes found in cystic ovaries are of three kinds: 1. An overgrowth of pre-existing tissue, which overgrowth is of such a character that it forms cysts from its mode of growth. 2. A degeneration, which, by its breaking down, forms cysts. 3. Simple distension of Graafian follicles.

In the first form the walls of the cyst are composed of polyhedral cells, each with a nucleus. The walls have a granulated appearance, caused by fine net-work, which is confused with a similar net-work in the nucleus. The net-work has a distinct mucous membrane. The number of cells forming the wall vary, and consequently their thickness and their blood-supply is from large capillary vessels passing between them at frequent intervals. They are surrounded on the outside by a layer of tissue resembling the stroma of the ovary, and projections from this layer pass in for a short distance here and there. On the inner surface there is a narrow band of fibrous tissue, while in the cavity are the remains of coagulated fluid, which has a decided yellow tinge, but no structure, beyond fibrin, and a few leucocytes.

The change is produced by an overgrowth of large cells derived from the epithelial columns of the Wolffian body, and in the ovary Balfour has traced them from the Wolffian body. These cells, which occur normally in the ovary, have, under certain conditions, the power of germinating and permeating the organ, and in doing so destroying the parenchyma of that organ, and their mode of growth is such as to produce a cystic change. There is nothing, however, to show that the new growth has any resemblance, in structure or progress, to carcinoma. The morbid change in the next class consists in a degeneration of a peculiar kind, which occurs in different parts of the organ and varies much in amount. The earliest change appears as very small, sinuous bands of homo-

geneous material among the spindle-cells of the stroma, which have disappeared and are replaced by this substance. It affects the adventitia of the vessel-walls, which become thick and converted into this homogeneous material, while the muscle-coat is not involved. This degeneration of the arteries is not universal, but affects one here and there. As the degeneration increases to some extent around the arteries, at the same time numerous isolated masses are seen throughout the organ. These vary in shape and size, some being sufficiently large as to be visible to the naked eye. The change in all, however, is the same,—a transformation of the normal tissue into a homogeneous hyaline material. It appears to be entirely without structure, but cells are seen in it. This degeneration has been variously described, but has generally been considered to be colloid. This it is not in its early development, and gives nothing approaching a colloid reaction in sections of the organ. Whatever the degeneration may be, its effect is to destroy portions of the organ by changing them into a hyaline material, the centre of which is prone to break down and form a cyst.

In the third class the cyst appears to be formed by dilatation of the Graafian materials.

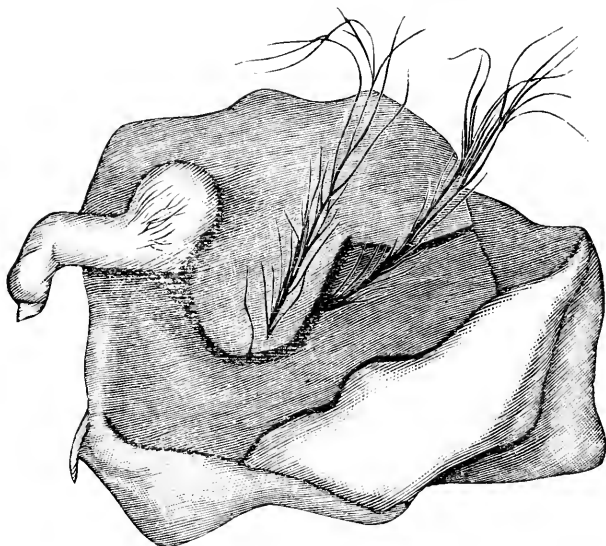
Origin of Dermoid Cysts.—W. W. Potter¹⁷⁰_{Dec., '89} says the most plausible theory yet offered for the formation of dermoid cysts is, that they result from a misplacement or involution of the epi- or meso- blast of the embryo at an early period of development. The misplaced epithelial elements contained in the stroma of the ovary, or any other organ, in developing produce a neoplasm whose inner walls assume the character of the epidermis, with its structure, appendages, and, in part, its functions.

Structure.—The walls of the dermoid cyst are composed of a muscular or external layer. All interest is centred in the latter, which consists of a corium and an epidermis of flattened epithelial cells, simulating closely the structure of the skin. This layer may vary considerably in appearance and structure. Sometimes it is of a smooth, epidermoidal character, or it may be nodular, with hypertrophy of the corium and epithelial cells, resembling warty excrescences. They are often found to contain cartilaginous tissue, irregularly shaped bony structures, as bony plates, misformed maxillary bones, with alveoli set with teeth and structures corresponding with the nails, upon the inner layer. This layer, at times,

possesses the appendages and structure of the normal skin, developed to a high state of perfection, with sebaceous and sweat glands, and their follicles capable of performing their various functions.

Lebert found the presence of teeth in half the cases of dermoid cysts. They may be set in alveolar cavities or attached to the walls by connective-tissue bands. The number of teeth found in them varies from one to three hundred. They may include incisors, canines, bicuspids, molars, or wisdom-teeth, perfectly developed, with fang, crown, neck, enamel, tartar, and cement.

Dombrowski²¹_{Aug.} reports the removal of a dermoid cyst which was found to contain a mass of bone formed exactly like the pelvis.



DERMOID CYST CONTAINING A RUDIMENTARY LITTLE FINGER.

(*Berliner klinische Wochenschrift.*)

H. Omori and J. Ikeda prepares the patient for operation with a dose of santonin, followed by castor-oil, and finds that it decreases nausea and vomiting.

In a dermoid cyst the size of a child's head, they found a rudimentary little finger. It was 5 centimetres long at the point, 2.5 centimetres at the base, 4 centimetres in circumference, and had a well-developed nail, which projected over the point. At the base it was black. We append a representation of the growth. A striking point about it is that the patient, a Japanese woman, has dark hair, while the rolls of hair contained in the sac are blonde.

Wm. Duncan ^{July 12} reports a case which opened into the bladder. Abdominal section was done, with recovery of the patient. The case was of interest, as the history and physical signs were exactly those of a suppurating pelvic cellulitis.

Intra-Ligamentary Cysts.—Skene ⁵⁹_{Apr. 19} says the difference between intra-ligamentary and other cysts lies in their relation to the broad ligament. Two theories for the topographical relation have been advanced. One assumes that, owing to some error in development, the ovary during embryo life found its way into the folds of the broad ligament, and made of it a capsule for itself. The other theory is, that during the growth of the cystoma it burrows, so to speak, into the folds of the ligament, and, once having insinuated itself there, pushes the folds apart, and these folds grow with the tumor and form a ligamentous capsule for it. The ovary must be closely attached to the ligament; it may be as the result of inflammatory adhesions. When a cyst develops deep in the ovary and offers resistance upon its peritoneal surface, it pushes its way between the folds of the broad ligament. This is evident from the fact that these cystomata come from the paroöphoron, which is the portion of the ovary nearest the uterine ligament. These cysts are more often single and are generally papillary or proliferous. The tumor may be situated in one broad ligament and push the uterus over to the other side; it may be between the uterus and both broad ligaments, when the uterus and bladder will be lifted up with the tumor; or posterior to both bladder and uterus, when the tumor will burrow deep in the pelvis, and the uterus will be pushed up. Its diagnosis is important. It may be suspected when the uterus is pushed up or lies behind or in front of a cystic tumor, which is firmly fixed in the pelvis; where the history of the patient gives no indication of previous inflammation; where the uterus is displaced laterally to a marked degree; but, as a rule, these tumors are proliferative, and present so much solid material that they are difficult to determine from fibroma, or fibro-cysts. They may be divided into two classes,—those in which the diagnosis may be completely made from physical signs, and those in which it will be necessary to resort to surgical measures (aspiration or laparotomy) to determine accurately the condition. A pregnant uterus, in color and vascularity, resembles these tumors and may lead to doubt. The

contraction of the uterus, the condition of the cervix and normal ligaments, as felt in the abdomen, will show pregnancy. There have been several methods adopted in operating:—

First, enucleation, because they have no pedicle. The cyst is tapped high to avoid the thicker part of the broad ligament, is emptied and drawn well out of the wound, and the capsule dissected off with knife-handle or finger. Any large vessels opened in this process may be immediately ligated or controlled by forceps. Where troublesome bleeding occurs from veins low down in the pelvis, they should be ligated, pressed with a hot sponge, or controlled by the use of a styptic. The capsule may be folded in and sutured with continuous sutures of catgut, except a part for drainage-tube, which should, when possible, be sutured to the parietes. Where portions of the cyst-wall have been left, these should be destroyed by applications of carbolic acid.

Another procedure is to remove the cystoma and its capsule. This is done by ligating the ligament below the tumor, and is applicable where the cyst is upon one side and does not dip down into the pelvis. There is danger of wounding the ureter or of inclosing it in the ligature. Another method, a combination of the two, is to include and afterward remove the capsule. There is a class of cases where the cyst is firmly fixed down by inflammation and cannot be removed. In such a case it should be emptied, opened, thoroughly cleansed with sponge or absorbent cotton, and any papillary tissue scraped away. Every precaution should be used not to contaminate the wound and the peritoneum. If properly coapted without infecting the surfaces, drainage is so complete that suppuration may go on in the sac without influencing the cavity. Convalescence must necessarily be slow.

W. W. Farr^{27 Nov.} reports a case in which the uterus was drawn to a length of $8\frac{1}{4}$ inches by the traction of an 18-pound intra-ligamentary cyst, in a woman 75 years of age. After extensive enucleation the tumor was removed and the patient recovered.

Bache McEvers Emmet^{27 July} suggests that when these tumors are not safely removable they should be drained and starved by cutting off the supply of blood through ligation of ovarian and uterine arteries and the vessels which reach the mass through the broad ligament.

Mundé suggests that, when the condition can be determined, drainage by the vagina is preferable.

Gersuny³¹⁷_{Apr.29, Oct.} describes a case of ovarian cystoma, over the entire surface of which, as well as through the vagina, could be seen and felt a marked pulsation, while two distinct murmurs could be heard on auscultation. The cyst proved to be an intra-ligamentary one, and was pushed back in such a way as to overlay the aorta, the pulsation of which was doubtless transmitted through it.

Double Papilloma.—Lomer³¹⁷_{Dec.29, '99} describes a case of double-sided papilloma of the ovary, with ascites and extended infection of the peritoneum, in which the masses were removed. The patient survived four and a half years without relapse. He classes these tumors with malignant, but says they do not preclude operation, as favorable cases have been observed after operation by Knowsley Thornton, Leopold, Cohen, and Freund.

Ovarian Fibroma.—H. C. Coe²⁷_{Apr.} reports a case of ovarian fibroma, and says that the large number of cases reported in the Obstetrical Society refuted the opinion of Tait and Doran that such conditions are rare. There is no reason why fibroma should not be developed in an organ so rich in fibroid tissue as the ovary, as well as in the uterus. Ascites was a marked symptom associated with the tumor presented. It is an error to suppose that ascites is associated only with cancerous growths, for Olshausen has pointed out that it may be associated with solid growths in the ovary, even when the tumor is small. The cause of the effusion is difficult to determine.

I would second what Coe has said with regard to the frequency of ascites in ovarian fibroma, as it has been noticed in cases in which extirpation of the growth has taken place sufficiently long without relapse to absolutely demonstrate the non-malignant character of the growth. V. O. Hardin¹¹⁷_{Feb.} reports a case of ovarian fibroma, weighing $3\frac{1}{2}$ pounds, which was accompanied by extensive ascites. Patient recovered.

Fibro-Myomata.—Milot-Carpentier¹⁷_{Apr.12} reports a case of fibromyoma of the left ovary, removed from a woman 37 years of age. The tumor had caused severe pelvic pain for a number of years and had attained to the size of a man's head.

Malignant Disease.—Malignant disease of the ovary is a

condition as to the frequency of which operators materially differ, some holding that all cystomata, particularly the multilocular forms, are malignant in character, and are likely to infect the surrounding structures if neglected sufficiently long. The growths, however, which are most dangerous are those of a more solid character.

Douglas Morton²²⁴_{Aug.} reports a case of solid ovarian tumor and cysto-carcinoma, which weighed 9 pounds, removed from a patient. It was deeply situated in the pelvis.

Lancial²²⁰_{Mar. 21} reports a case of cancer in a patient 50 years of age, in which the ovary was almost destroyed, and the disease had extended on to the uterus and down into Douglas's pouch.

Malins⁶_{May 31} reports a case of carcinoma of the ovary removed from a child 9 years old.

II. W. Freund,⁹⁶_{May} in discussing the treatment of ovarian malignant disease, says the contra-indication to laparotomy is the discovery of metastasis. Where malignant ovarian tumors are confined to the ovaries, laparotomy should be performed. As we are unable to diagnosticate with certainty the malignant disease before operation, even in cases of extensive metastasis, an incision, with cleansing of the peritoneum, would produce a better state of health for quite a long time. He says that accompanying secondary tumors in the ante- or intra- uterine space should not contra-indicate operation.

Hæmatoma.—Mundé²⁷_{June} reports a case of hæmatoma of both ovaries. One had attained the size of an orange, the other to that of an egg. Conditions not diagnosticated before operation.

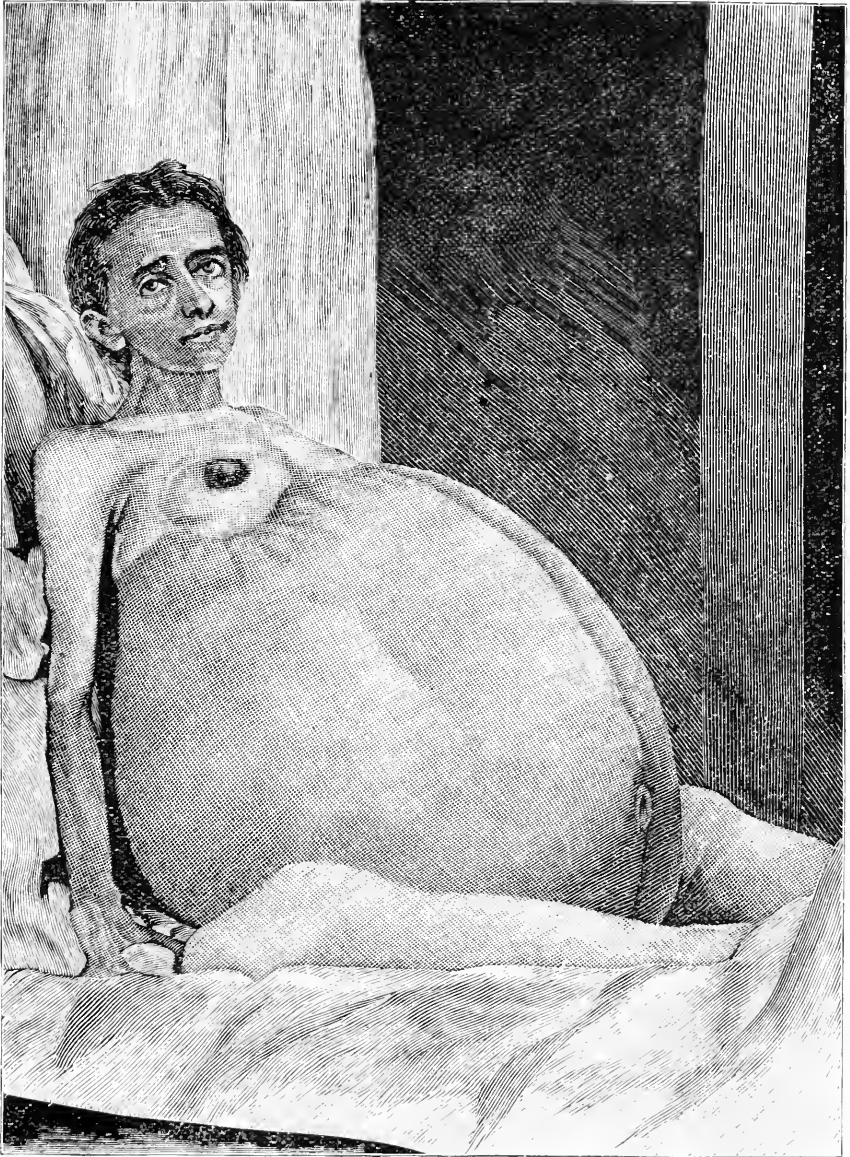
The writer can bear testimony to the difficulty of arriving at a diagnosis in these cases by his own experience in a recent case. The operation was done with the supposition that the masses filling up the pelvis were pus-sacs, but they were found to be hæmatoma, each the size of an orange. The ovarian structure was completely destroyed, forming thin-walled cysts.

II. J. Boldt⁵⁹_{Sept. 6} saw a nearly fatal case of peritonitis result from the rupture of an ovarian hæmatoma not larger than a cherry.

Tubercle of the Ovary.—O'Callaghan¹⁶_{Jan.} urges early operation in ovarian cyst, and claims that tuberculous disease with peritonitis is likely to result from their neglect.

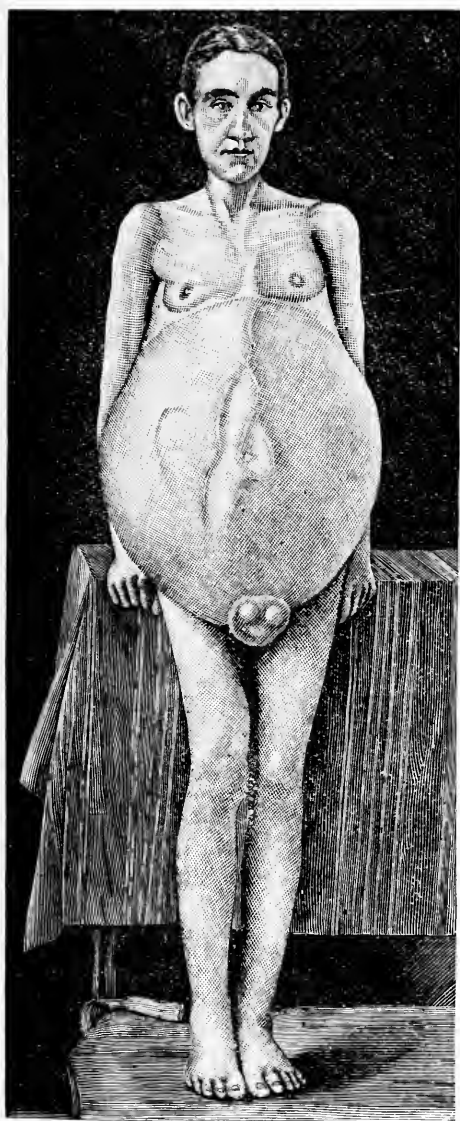
Wagner⁶_{Dec. 7, '89} finds tubercles in the ovaries of 5 per cent. of tuberculous patients.

Saenger²_{Sept. 20} reports an ovarian cyst in a woman 67 years of



OVARIAN TUMOR.
(*New York Medical Journal.*)

age, where the cyst had become infected with tuberculous material by repeated tapping through an abdomen which was the seat of tuberculous peritonitis.



ENORMOUS OVARIAN CYSTS.
(*American Journal of Obstetrics.*)

Large Cysts.—C. K. Briddon¹_{Feb. 5} reports a case of multilocular cyst weighing 149 pounds. The cut on page 47 represents the appearance of the patient.

An attempt at removal was made, but its adhesions were found so extensive that it was discontinued and drainage induced. Patient died immediately after the attempt at operation. Weight of cyst determined at the autopsy.

J. E. Abbott²⁷_{Apr.} operated upon a woman aged 26 years. The tumor had been growing three years. She measured 58½ inches at the umbilicus; from right anterior-superior spine of the ilium to the umbilicus, 20 inches; from left anterior-superior spine, 11 inches; from pubes to umbilicus, 15 inches; from ensiform cartilage to umbilicus, 25 inches. The patient weighed 202 pounds; weight of fluid, 80 pounds; weight of sac, 11 pounds. Patient died.

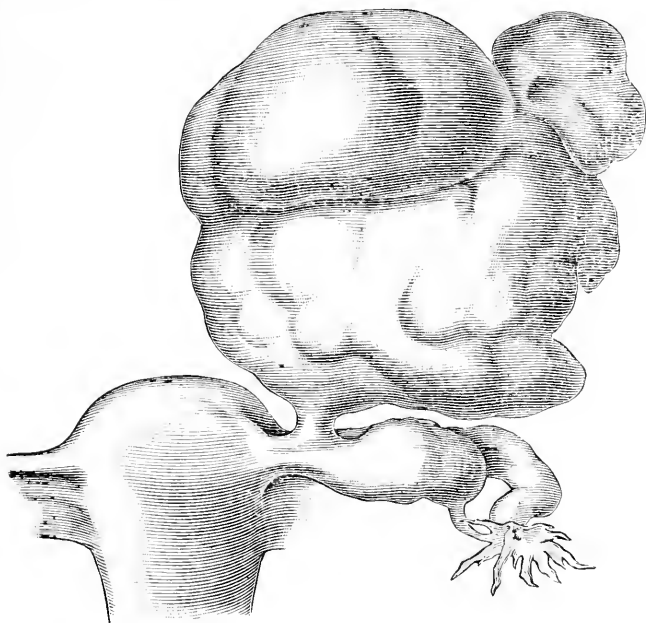
He believes that previous aspiration would have saved life. Death, in these cases, is due not so much to the sudden removal of the pericardial pressure as to the sudden reduction of endocardial tension. He urges, in all

cases of large cysts, the removal of the fluid by a primary operation and the cyst by a secondary one.

Fibro-Cysts of Ovarian Ligament.—Dolérís²¹_{Mar.9} reports a case of fibro-cystic tumor of the ovarian ligament, seen in the accompanying diagram.

The woman had been twice delivered before the operation for the removal of the tumor, which was largely made up of myomatous tissue.

Diagnosis.—Bacelli,⁸⁴_{Apr.12} in ascites under normal relations, has



FIBRO-CYST OF OVARIAN LIGAMENT.
(*Journal de Médecine de Paris.*)

almost constantly found a deep tympanitic sound during percussion in the region of the intestines. If, however, an ovarian cyst is present, there is a tympanitic percussion on the one side and on the other dullness. Dullness is present on that side in which the ovarian cyst had its origin.

Mundé²⁷_{June} reports a case of tumor that had grown in six months to such a size that it reached from the left hypochondrium down into the right iliac fossa. It was apparently hard and movable. The upper portion, slightly above the umbilicus, had a sharp feel like the inner border of the hand. It was diagnosticated as an

enlarged spleen, but was found, upon operation, to be a multilocular ovarian cyst.

Cushing⁹⁹ reports a case of ovarian cyst which felt to the touch as though containing fluid, but the trocar revealed a jelly-like fluid which would not run. Around the insertion of the pedicle there was a cancerous infiltration.

OVARIOTOMY.

Bantock⁴⁹ reports 238 cases of ovariectomy, with 21 deaths. He ascribes his success to the absence of Listerism. No antiseptic is used. He declares carbolic acid and sublimate agents dangerous. The abdomen is irrigated with plain water. The researches of Delbeet show that the temperature of the water, between 65° and 122° F. (18.4° to 50° C.), has no appreciable effect upon the respiration or circulation, except that the lower temperature increases the tendency to shock. Where the operator must have some agent, he would recommend a solution of common salt. As the outer part of the pedicle not infrequently slips out of the loop, he ligates it with a separate ligature.—prefers the figure 8. He has discontinued the use of opium and has found the mortality in the after-treatment greatly decreased. He operates in the morning. Last food, a light supper. Where the stomach contains a watery mucus, causing continuous retching, he gives a few ounces of hot water; and in bilious conditions, where the bile vomited is yellow, gives hot water; if greenish, hot water and bicarbonate of soda, 15 to 20 grains (0.97 to 1.3 grammes). In thirst he avoids ice, rinses the mouth with warm water. He does not believe in saline purges. In some cases enemata of hot water are of great value.

Leopold³¹⁷ has suggested that pelvic and abdominal operations are greatly expedited by having the pelvis of the patient elevated during the operation. By this procedure the operator is troubled less with a prolapse of the intestines, the abdominal walls are more relaxed, and he is able to see into the pelvis to a greater degree. This elevation is accomplished by having a movable flap upon the table, similar to a bed-rest, which can be raised up after the patient is under the influence of an anæsthetic.

Operation During Menstruation and Pregnancy.—It is generally supposed that it is better to perform the operation during the menstrual intervals. There are cases, however, in which the delay

incident upon this would impose considerable suffering, both mental and physical, upon the patient and others, in which it would be attended with danger. Dudley²⁷_{Feb.} says the presence of menstruation is no contra-indication to the performance of the operation, and that the decreased congestion of the pelvis resulting from its presence, in his judgment, proved a safeguard against peritonitis. The age of the patient and the existence of pregnancy do not seem to exert a marked influence upon the result. Josephson, of Stockholm,⁹⁶_{May} performed an ovariectomy upon a woman aged 76 years. The tumor filled the entire abdominal cavity. Recovery took place without any unpleasant symptoms. Kollock⁸¹_{June} reports the removal of a tubal dermoid cyst during pregnancy at the fifth month, without any influence upon the progress of the pregnancy. Lawson Tait²²_{Feb.} says: "Under ordinary circumstances, the mortality of the operation is slight; it is, however, dependent upon the condition of the patient upon whom it is done, and consequently the mortality is not dependent upon the operation itself. It is sometimes necessary, in order to determine the condition of the pelvic organs and the advisability of their removal, that an exploratory incision should be made. I never operate upon a patient, if I can help it, unless she has been under my care for forty-eight hours. She is given a slight laxative the night before and an enema the morning of the operation. The anæsthetic is 2 parts of ether to 1 of chloroform, under 45 years, and over 45 I increase the quantity of chloroform until, at the age of 60, chloroform alone is given. If chloroform kills a patient, it does so at once, and there is an inquest and a lot of trouble; whereas, if the patient dies a week later, it is attributed to some other trouble and not to the proper cause. The instruments are laid upon a table and every care taken to see that they are perfectly clean." He keeps them in trays, in order that the blood may wash off and decrease the danger of introducing any extraneous matter into the wound, such as coagulated blood. It is the nidus for germs, and not the germs themselves, that is to be feared. Sponges are a source of a great deal of anxiety. He has a person who does nothing else but attend to his sponges. She washes them, hangs them out and dries them, for so long as they are dry they are incapable of decomposition. He counts them out himself, and then one nurse is given the duty of looking after the sponges, and she is responsible that the requisite number is outside the

abdomen at the close of the operation. No one but himself and the nurse touch these sponges. The incision is made 2 to 4 or 5 inches in length, down to the tendons, these cut through with a knife, until the margin of the rectus is seen, the sheath seized and split open, the peritoneum grasped with a pair of forceps and given to the assistant to hold; it is seized with a second pair of forceps about the same point and sufficient traction exercised to put the peritoneum upon the stretch, by which it is raised above the subjacent structures, and a slight touch with a knife will suffice to make an opening. As soon as an opening is made, the intestines shrink away and there is little danger of their being wounded with the least ordinary care. The incision should always be made in the middle line, unless you accept the tumor as being eccentric. Incisions may be divided into centric and eccentric. Centric incisions comprise those which deal with tumors present under ordinary conditions. Eccentric abdominal incisions are such as are obliged to be made, leaving the point of election for cutting elsewhere. Attack the tumor, whatever it is, at the most prominent point. The instruments next in importance to the knife are the scissors and hæmostatic forceps.

Sutures and Ligatures.—Morris²³_{Sept.} commends catgut as the best material for ligatures and sutures. He procures bunches of 1 metre length, raw and unprepared, of the sizes 5, 7, and 9. These are placed in oil of juniper-berry for a few days, for the purpose of dissolving out the fixed oil and killing the micro-organisms; on removal from the oil they are placed in wide-mouthed bottles containing 95-per-cent. alcohol, to which is added bichloride of mercury, 4 grains (0.26 gramme) to the pint. The catgut is taken out of this as needed at the operating-table. No. 9 catgut will be absorbed in about six days, and is used for all vessels smaller than the radial artery, for intestinal sutures, and for skin-sutures where there is not much tension. No. 7 will be absorbed in about twelve days, and is used for ligating large blood-vessels, for skin-sutures, peritoneal sutures, general intra-abdominal ligating, and for suturing wounds made for the repair of the vagina and the cervix. No. 5 catgut is used in only one place regularly, in abdominal work, and that is for approximating the fibrous structures of the abdominal wall. It is absorbed in about eighteen days. H. C. Coe²⁷_{Apr.} has seen a silk ligature in the abdomen unchanged a year after the operation.

After-Treatment.—Tait says the after-treatment of the patient is practically conducted by the nurse. For the first twenty-four hours the patient is not allowed to swallow anything at all, unless, perhaps, a little warm water. Vomiting is avoided by giving the patient nothing to vomit. The second day he gives a few tablespoonfuls of milk and soda. The third day is the critical one, and as an indication of secondary danger the distension of the epigastrium is looked for as suggestive of peritonitis. Give the patient a small saline purge and a turpentine enema. The question of temperature in abdominal surgery is a matter of secondary importance, the pulse being our guide. When it rises to 120 there is reason to be anxious.

Sterilization of Dressings.—Rein²⁷_{Sept.} says that in order to attain the end of modern wound treatment—keeping the wound sterile—the following points are to be recommended: The single sterilization of the ligatures, dressings, etc., by steam at 100° C. (212° F.) is insufficient, because the microbes and their spores are not all killed. Compressed steam, however, at 110° to 119° C. (230° to 246° F.) is certain to be effective. Only sterilized water must be used. Sterilization of the air is necessary, and is better effected by filtering the air through cotton in the afferent ventilating channels than by wetting the air with powerful sprays of water. For cleansing the wound, sponges, and instruments, weak antiseptic solutions are to be used.

Drainage.—C. B. Penrose⁶¹_{Feb. 22} says the drainage-tube, properly cared for, is not a source of danger, its object being to prevent the accumulation of fluid in the peritoneal cavity. Dangers from such accumulations are septic changes, which may produce general and local trouble. These changes, if pre-existing, generally come from without; but in pathological conditions, from overdistension or otherwise, infection may take place from the intestinal tract. The absorbing power, from experiments upon lower animals, is from 5 to 12 pints of fluid per hour for human peritoneum, or in from twelve to thirty hours a quantity equal to the weight of the body. Cases demanding drainage may be arranged as follows: 1. Where the operation has been of long duration there has been much manipulation, and we fear excessive secretion from the irritated peritoneum. 2. Where extensive raw surfaces or bleeding adhesions are left, or where we fear bleeding from any other cause.

3. Where there is existing peritonitis or ascites. 4. Where septic matter has escaped into the peritoneum or where portions of the tumor are left. 5. Where there is malignant disease and we fear subsequent infection. In some cases of suppurative peritonitis a number of drains may be used. Capillary drainage in many instances is a valuable method, possessing advantages of promptness, thoroughness, and complete exclusion of air, at the same time giving complete rest to the patient and to the parts about the drain.

Wicking is a better drain than gauze, as it acts more rapidly and is less likely to become incorporated with the surrounding tissues. These drains may remain several days, as many as ten to fourteen, if the superincumbent gauze is frequently changed. Some of the accidents or *sequelæ* of drainage are: 1. The formation of local peritoneal adhesions around the drainage-tube and the persistence of a fibrous band in the site of the tube-tracts, which may cause subsequent bladder trouble or intestinal strangulation. 2. The incarceration of the omentum or shreds from the adhesions of the intestines or tube. 3. Prolonged suppuration from the drainage-tube tract or an incurable sinus. 4. Fæcal fistula from pressure of tube upon the intestines. 5. Ventral hernia resulting from imperfect approximation of fascia and muscles.

In conclusion, he says: "The abdominal drainage-tube, properly used, does not increase the mortality after laparotomy. Confidence in this fact is necessary for a correct determination of cases requiring drainage. Frequent careful cleaning of the tube is of the greatest importance. The few annoying *sequelæ* attending its use can be avoided or easily cured. It is safer to use the drainage-tube too often than too seldom, as we would, in case of doubt, use any other precautionary measure."

Saenger²³_{Nov.} uses a curved-glass tube, a quarter- or half- circle. After being placed posterior to the uterus the superfluous fluid is emptied by pressure upon the sides of the abdomen. The tube is dried by passing down it with a properly-curved copper wire strips of fresh gauze until it is almost completely dry. The top of the tube is then covered with crumpled gauze and wood-wool and the whole hermetically sealed by pieces of adhesive plaster as large as a handkerchief. This dressing is not changed for twenty-four

hours, and then under strict antiseptic precautions. Narrow rolls of gauze are pushed into the tube by the curved sound until practically all the secretion is absorbed. Dressing changed every twenty-four or forty-eight hours and the tube removed at the end of three or four days, providing the secretion has ceased; otherwise, from the sixth to the eighth day.

Yandell²²⁴_{Mar. 29} declares his partiality for the drainage-tube, which he is in the habit of emptying as the patient is taken from the table. Then, as long as he can get a drachm or two of the fluid, he changes it every hour and never allows a tube to go longer than two hours without cleansing.

Byford⁶¹_{Mar. 15} says the iodoform gauze or Mikulicz drainage is one of the most valuable of the later improvements in the technique of abdominal surgery. In a case in which two large abscesses and the appendages were enucleated and removed, the oozing from the intestinal walls, broad ligaments, posterior surfaces, bottom and both sides of the pelvis, threatened, if not checked, to destroy the already-exhausted patient. A sack of iodoform gauze to fit the interior of the pelvis was made and packed with gauze, which transformed the discharge of blood into serum and the condition of the patient from one of alarm to one of comparative unsolicitude. The gauze was removed little by little each day, in order to allow the intestines to fill in the evacuated space. Last gauze removed on the eleventh day, with no bad symptoms resulting.

Joseph Price⁹_{Mar. 15} directs attention to some cases of suppurative peritonitis, where the condition of the patient is such that we must be content with irrigation and drainage only. Too much surgery in debilitated patients will kill as surely as none at all.

Complications.—R. L. Douglass¹_{Dec. 21, '89} divides complications in ovarian cysts into two classes: 1. Those affecting the tumor itself, viz., adhesions, twisting of the pedicles, inflammation, suppuration, rupture, calcification, and others of minor importance. 2. Complications due to the presence of the tumor but not affecting the growth itself, as ascites, albuminuria, marasmus, and intestinal adhesions.

The diagnosis of intestinal adhesions is exceedingly difficult to determine. We must depend upon the history, although it should be remembered that we may have peritonitis without

adhesions. Small dermoids are more liable to inflammation, and therefore readily contract adhesions. Adhesive bands form at the site of tapping. Strangulation of the pedicle from torsion or otherwise causes venous stagnation. Mortification would quickly supervene were it not that adhesions are quickly formed. Adhesions may be in direct apposition, immediate, or by broad, lengthy, flat, or round bands, the mediate variety. Omental adhesions are the most frequent. Adherent viscera may be sponged off when slight. Hæmorrhage can be controlled by pressure, salts of iron, or vessels ligated. Adhesions deep in the pelvis are the most annoying, owing to the danger of injuring the bladder, ureter, or some of the large vessels. Recently, in removing a large cyst from a woman 65 years of age, I tore a large branch of the internal iliac vein, from which the pelvis was immediately filled with blood. After arresting the bleeding with sponge-packing, the cavity was filled with iodoform gauze. The patient died a few hours later.

Rotation of tumors, or torsion of the pedicle, is met with in all varieties of tumor. The necessary requirements are that the tumor be free from adhesions and the pedicle long. The condition has been attributed to passage of feces in the bowel, peristaltic action of the intestines, development of pregnancy; probably, in all, due to the natural rotation of the cyst on its pedicle with the movements of the patient.

The gravity of the symptoms are dependent upon the extent of torsion. It is always accompanied by pain, tenderness, vomiting, and general symptoms of inflammation. The condition has been mistaken for rupture of ectopic gestation and intestinal obstruction. The tumor forms new adhesions, by which it is nourished, and the pedicle may be entirely separated. Hæmorrhage may take place into the cyst from rupture of a vessel upon its inner surface. The gravity of the situation may be aggravated by inflammation and suppuration of the cyst. The latter may be due to torsion of the pedicle, careless and useless tapping, and traumatisms.

Reboul³_{p.317} says that torsion of the pedicle of ovarian cyst manifests itself in the abrupt form by a subacute pain and by an augmentation of the volume of the tumor, which is definitely fixed. In his case he had determined two signs which affirm the diagnosis

without intervention. These two signs were, a blowing noise heard very clearly at the point of pain,—that is, at the level of the pedicle of the cyst; a movement *en masse* of the tumor, giving the sensation of rising of the stomach—a slipping undulation coincident with the arterial pulse.

Edis⁴⁹_{Nov.} reports a case in which the pedicle was twisted one and a half times, consequent upon pregnancy. Tait and Barnes both believed shock in such cases due to twisting rather than to accompanying hæmorrhage.

G. M. Tuttle²⁷_{Jan.} reports a case of strangulation of the sac from four turns of the pedicle.

Voituriez²²⁰_{June 20} says torsion of the pedicle occurs in about 6 per cent. of ovarian tumors, but only in those which are mobile and have long pedicles. He divides it into three different classes: 1. Torsion without ischæmia of the cyst. 2. Torsion with ischæmia of the cyst. 3. Rupture of the pedicle, separation of the cyst.

The first form is frequent and may produce no appreciable symptom of any immediate gravity. The twist may be about one-half or sometimes an entire twist. The second degree is a much more grave condition. It may take place suddenly or gradually. The symptoms of the sudden attack are violent abdominal pain, sensation of fainting, cold extremities, and symptoms of internal hæmorrhage. This hæmorrhage takes place into the cyst. Peritoneal adhesions are set up as a result of the peritonitis, which is always adhesive, never suppurative. These adhesions serve, usually, to give renewed nutrition and fix the tumor for the future. In the third degree, separation of the pedicle is a result of the second degree. The pedicle is twisted until its nutrition is arrested and it undergoes necrobiosis and is absorbed, leaving the tumor to be nourished by its new attachments.

Calcification is a Rare Complication.—Strittmatter, in a personal communication, reports a case in a woman 54 years of age in which a small ovarian tumor, the size of an orange, had undergone calcification, forming a hard, dense mass which resembled bone. It was quite movable, attached by a pedicle of some length. Patient recovered subsequent to the removal of tumor.

Dropsy may arise from accompanying cardiac, renal, or hepatic disease. It may be caused by torsion of the pedicle. Rupture of the cyst would cause sudden ascites. Papillary and all malignant

cysts are complicated with ascites. The presence of a small cyst with ascites is an indication of malignancy.

The presence of albumen in the urine is not an uncommon occurrence. When associated with high specific gravity, it is presumptive of advanced kidney disease.

Rupture of the sac may take place as a consequence of over-distension, suppuration, weakening by papillomatous degeneration, or violence. If fluid, not irritating, but little reaction. Papillomatous tumors are liable to rupture; the danger arises from the opportunity for infection of the peritoneum. A mono-cystic tumor is more liable to rupture than the proliferating, granular, or multilocular. Acute pain, evidences of collapse, and marked change in the form of enlargement are symptoms indicating impending rupture. If the patient does not succumb to shock, she is in danger from septic peritonitis. Immediate operation, irrigation, and drainage are demanded.

Cystic Ovaries.—Cystic degeneration of the ovaries may be the cause of almost continuous hæmorrhage, as in the case of Waldo.²⁷_{Apr.} Bulens⁵_{Feb.} describes the microscopical appearance of the so-called cystic ovary, which, he says, indicates either an arrest of the development of the ovisac or a normal retrograde metamorphosis of the same; in fact, in the appearance of sterilization, few of the ovisacs mature, as shown by the rare occurrence of corpora lutea in such ovaries. In the slighter forms there is no change in the stroma. The writer believes that cystic degeneration results from excessive sexual excitement and from the presence of peri-öphoritis, salpingitis, and ovarian and uterine tumors.

Peritonitis.—W. Gill Wylie²⁷_{Feb.} does not regard the presence of an acute attack of peritonitis as making any difference in the result of an operation unless the patient's blood is markedly affected by some septic condition. During a general or local peritonitis, he would prefer taking the risk of an operation to having the patient pass through the attack. Adhesions will be found softer and more manageable. In regard to hæmorrhage from adhesions, if the broad ligaments are properly and quickly tied, little time being lost in the separating of adhesions, very little blood will be lost. If there be bleeding vessels in the separated omentum, they should be tied at once. The intestinal vessels should not be disturbed in separating adhesions; consequently, there is no other

place for hæmorrhage to come from, and if much blood be lost it is the fault of the operator, in loosening adhesions and shaping the pedicle so that it can be tied quickly. The fact that ovarian tissue is often left is a very important one, and I might state that sufficient attention has not been given to it. It is only a question of time in such cases when menstruation will return, with many of the old symptoms.

Injuries to Bladder.—A. Reeves Jackson^{61 Feb. 22} reports 67 cases of injuries to the bladder among 41 operators. In many of the cases no possible diligence could have averted the accident. Adhesions of the peritoneal surface of the injured bladder to that of the anterior wall frequently cannot be discovered in advance, and their existence is only demonstrated after the viscus has been opened. The use of the catheter as a diagnostic means is not always available, as the pressure of the bladder against the pubes may prevent the introduction of the instrument beyond that point. Another precaution is to avoid prolonging the abdominal incision far downward toward the pubic bone, in opening the peritoneum, until the relations of the bladder are ascertained. The mortality of the cases in which the bladder has been wounded is large, namely, about 30 per cent.; but this is due to the complicated and serious character of the cases in which the accident has occurred, consequent upon increased length of operation and the greater danger from shock rather than to the mere vesical injury. Inasmuch as the bladder is recognizable with more difficulty when empty than when full, it is better to begin the operation with the viscus partly or wholly distended; when its position has become known, after the completion of the abdominal incision, it may be emptied by an assistant. When it is known at the time of the operation that the bladder has been cut or torn, the opening should be at once closed with a continuous suture of catgut or fine silk, so applied as to invert the edges of the wound and bring together the peritoneal surfaces. A permanent catheter should be used during the first two days. After the expiration of that time its constant use is usually unnecessary, and if the wound has been small (less than 1 inch in length) the instrument may subsequently be dispensed with. If, however, the wound has been large (exceeding 2 or 3 inches), the bladder should be artificially emptied as often as every three hours for three or four days longer. In all

cases the catheter should be used as long as the urine contains blood. In a case in which the urine escapes through the abdominal wound subsequent to the operation, at a time and under circumstances which make it dangerous or inexpedient to reach the site of the vesical injury, the catheter should be used, either continuously or at short intervals, for the purpose of lessening the amount of urine escaping through the fistula. In the closing of the latter, in exceptional cases, it may be expedient to affix the wounded edges of the bladder within those of the abdominal incision in the manner detailed by Thomas and others; but, as this method must interfere, to some extent, with the subsequent control of the bladder, it is not to be generally recommended, as a continuous suturing and dropping back of the vesical wound is the better method.

Incomplete Removal.—The re-establishment of the menstrual functions, and often conception, in cases in which only a small portion of the ovary has been left in the pedicle, leads us to consider whether it may not be possible at times to remove the diseased portions of the organ, leaving the healthy portions remaining. Martin²⁷_{July} says the attempt to remove the unhealthy portions of a partially-diseased organ, allowing the sound portions to remain, has frequently been made. He gives 17 cases in which ovaries and tubes have been partially or wholly excised,—10 cases of excision of ovaries, 7 of tubes. The 10 oöphorectomies resulted in uninterrupted healing without resumption of normal menstruation. Three cases subsequently conceived. The diseased parts consisted generally of follicles or cysts. Of the 7 cases of tubes all but 1 did well; in that case secondary laparotomy was performed for ordinary cystic degeneration of the residue. The writer has, in small cysts of the ovary, opened the cyst, peeled out the secreting surface, and sewed up the ovary with fine catgut. The patient recovered without an unpleasant symptom, and subsequently maintained her functions normally.

Removal of the Uterus Without the Ovaries.—Verf⁴¹_{June 23} says that when the uterus is removed, leaving the ovaries, these organs undergo anatomical or physiological changes as a result, but continue to form Graafian follicles, which burst and form corpora lutea. In a case that died of typhus, four years after extirpation of the uterus, the microscope revealed no change from

the normal in the ovaries. He therefore believes that these organs should be removed with the uterus. The writer now has a case from whom the uterus was removed two years ago, leaving the ovaries. The patient suffers from periodical attacks, evidently induced by the process of ovulation, in which the discomfort is very marked. She occasionally has at such times a vaginal discharge of watery fluid, which greatly relieves the discomfort.

Sequelæ.—Edgar DuCane^{6 Aug. 20} reports a case of uterine inertia following the removal of both ovaries for ovarian tumor, which, he thinks, justifies Tyler Smith's ovarian theory of parturition. The large number of cases, however, in which both ovaries have been removed during gestation, and the patient has continued until the completion of gestation and has gone into labor normally, would lead us to believe that this hypothesis of the occurrence of parturition was more imaginary than real.

Terrillon^{91 Nov. 10} reports a death from intestinal obstruction due to paralysis of the muscular coat of the gut. He believes, with Olshausen, that the condition is due to prolonged exposure of the intestines to air, producing a slight inflammation of the serous coat. Paul Raymond^{2 Nov. 8} mentions a case of periodical hæmoptysis after the removal of the appendages. It occurred every month, four or five times daily, and lasted from two to three days. She presented evidence of phthisis in the right apex.

Herff^{317 Oct. 20} says death after ovariectomy may occur from cardiac, pulmonary, or renal troubles, referable to the prolonged administration of chloroform. Aside from fatty degeneration and brown atrophy of the cardiac muscle, which has been noticed in fatal cases, the prolonged inhalation of chloroform may cause degeneration of the same, leading to collapse after the operation. This never occurs with ether. Fatal hypostatic congestion and bronchial pneumonia may occur in weak patients with diseased hearts, due solely to the inspiration of the secretions from the throat. If there is pre-existing trouble, the danger is great, even when ether is administered.

I. S. Stone,^{61 Aug. 30} in answer to assertions that gynecological operations tend to produce insanity, says that the record of cases reported insane, as a result of operation, carefully analyzed, show that the patients were predisposed to insanity or had had attacks prior to operation.

A patient of the writer, who has been reported on the list of those becoming insane after the removal of the appendages, had been confined in an insane-asylum for nine months, some two years before the operation was performed, and had been more or less insane four years prior to the operation. For a year subsequent to its performance she had been perfectly well.

Mann¹⁷⁰_{Apr.} reports a case of ventral hernia after ovariectomy performed two years before. Under a little extra effort the hernia ruptured, permitting the intestines to escape. Patient recovered after immediate suturing of the wound. He advises to avoid hernia, the suturing of the peritoneum with continuous catgut sutures, and the external surfaces with silver wire.

Repeated Operations.—Secondary sections have been repeatedly made, often necessitated by portions of ovary, as reported by B. C. Hirst,²⁷_{Apr.} where, in addition to portions of ovary, a ligature was found, or remains of tubes, as cited by Penrose.²⁷_{Apr.}

H. T. Byford¹¹⁵_{Feb.} reports the case of a patient upon whom 3 peritoneal sections were done in nine months: (1) vaginal section and removal of one ovary; (2) ventral section, by which uterus and other ovary were sutured to anterior peritoneum; (3) inguinal section, by which remaining ovary was removed. Patient recovered.

The writer did a secondary operation upon a patient during the current year who underwent 3 operations subsequently, making 5 operations in all. The first operation was for the removal of the appendages, the subsequent ones for adhesions.

DISEASES OF THE VAGINA AND EXTERNAL GENITALS.

By J. M. BALDY, M.D.,

ASSISTED BY

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PHILADELPHIA.

CLITORIS.

Epithelioma.—Edis⁴⁹_{Nov., '89} reports 2 cases of this disease. The first patient was a single woman 43 years of age. She had complained for about five years of irritation about the parts, but the growth had only been noticed for a short time. She suffered from severe irritation about the meatus urinarius, sometimes accompanied by pain on passing water. During the last three weeks there had been a slight discharge from the growth. The glands were not in the least implicated. He removed the clitoris with a Paquelin cautery. There was no hæmorrhage to speak of, and the wound healed quickly. Four months later there had been no return of the disease. The second patient had been treated for more than a year for chancre, with no improvement. The glands were enlarged. Although the growth was removed, the woman died three months later.

Myxosarcoma.—Robb⁸⁵⁸_{V.2, Nos.3,4} reports the case of a Polish woman, 26 years of age, and married. She complained of a constant pain about the external genitals, which was increased by coition. A tumor was found occupying the position of the left crus clitoridis, pointed at either end, hard, movable, and slightly lobulated. The tumor, which was contained in a fibrous capsule, was enucleated without much difficulty. The operation was done under the influence of cocaine. There was scarcely any pain felt during the manipulation, but a free venous oozing followed, which caused much annoyance. The wound healed well. A microscopical examination of the mass proved it to be a myxosarcoma.

Elephantiasis.—Kelly⁸⁵⁸_{V.2, Nos.3,4} reports a case in a poorly-nourished negress. Menstruation was irregular and profuse, accom-

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panied by slight pain. She had a constant leucorrhœal discharge, and complained of pain in the back, abdomen, legs, and privates. She was very constipated and troubled with frequent micturition. Examination showed the cleft of the vulva distended and filled with a tumor 10 centimetres long, 5 centimetres broad, and 4.5 centimetres thick. Both nymphæ were much thickened. The mass was drawn well out from the body, and the pedicle thus formed transfixed with several sutures and ligated. A microscopical examination showed the case to be one of syphilis, with elephantiasis, involving the upper portion of both labia minora and the body of the clitoris.

Adherent Prepuce.—Leonard²²⁷_{Jan.} reports the case of a girl 11 years of age, who suffered from chorea due to adherent prepuce of the clitoris. She had been troubled nearly a year, with no period of complete relief. She was anæmic, fretful, and had all the usual symptoms of chorea, though not with the exaggerated movements sometimes seen. During her illness she had been treated with constant doses of arsenic, and with a general iron tonic. Her eyes had been carefully tested by a competent oculist, and suitable glasses prescribed, but with no effect. A local examination revealed a prominent clitoris, with the prepuce closely contracted about the glans, presenting an opening not larger than the head of a pin. The whole organ was inflamed. The prepuce was stripped back, pus was found and removed, the adhesions broken up, and the parts kept bathed with a solution of permanganate of potash and boracic acid, alternately. In two weeks the little patient was entirely well, and remained so.

Erethism.—M. R. Hawthorn¹⁹⁹_{Oct.} had for a patient a woman 58 years old, weighing 175 pounds. She was a widow of 6 years' standing, with two children. She had passed the change of life some years before, and immediately after this period had been seized with an uncontrollable desire for sexual intercourse, which had continued in spite of the most vigorous treatment. In despair, although a Christian scientist, she had her clitoris amputated close up to the pubic bone. Finding no relief from her intense desires, she finally married a second time. For the first three days after marriage it seemed impossible for her husband to satisfy her. Then a reaction set in, and the act became so repugnant to her that she lost her appetite, and, together with this, over 40 pounds

of flesh. The labia became soft and flabby, and in the space of twenty days dwindled away into folds and wrinkles. A divorcee was finally asked for and granted.

HYMEN.

McKee¹⁶⁷_{Oct.} says that the development of the hymen has been thoroughly studied by Schaffer, Bland Sutton, von Hoffman, Pozzi, and Scanzoni, who believe this organ to originate from the cloaca. He classifies the varieties as follows: (1) the hymen semilunaris, or normal hymen; (2) the hymen circularis, with small central opening; (3) the hymen cribriformis; (4) the hymen fimbriatus; (5) the hymen imperforatus; (6) in rare instances the opening of the hymen is found divided by a perpendicular bridge into two parts; (7) in some instances there is a variety in which there exists an upper or anterior and a lower or posterior opening, with a simple band lying transversely across the vagina; (8) the horse-shoe hymen; (9) the bilobate hymen. Abnormalities of the hymen occur in about 8 per cent. of the cases, and it is claimed that they result either from torsion of the oviducts or late and asymmetrical re-absorption of the membrane. Cysts of the hymen are reported by Piering and Ziegenspeck. Krysinsky, of Dorpat, reports a rare case of anomaly of the hymen. There was a peculiar valvular arrangement, which inclosed a blind pouch. No urethral opening could be found anterior to the hymen. The urine passed through a small opening in the side of the vulva, which would barely admit of a 5-millimetre sound. The opening of the urethra was in the vagina behind the hymen.

Imperforate Hymen.—W. Sykes²_{Mar.1} calls attention to what is probably the first example of this deformity on record, viz., that reported by James Cooke, of Warwick, England.¹⁰⁷⁷_{Mar.1,1647} A physician¹_{Apr.12} reports a case where persistent attempts at intercourse for two weeks had failed to effect a passage, and it was necessary to incise the obstructing membrane.

Lamargue¹⁸⁸_{Aug.17} reports a case of imperforate hymen, with an accumulation of the menstrual fluid in the vagina and uterus. An operation was performed, and the patient died of septicæmia. Kinloch²⁷_{Aug.} reports the case of a girl, 18 years old, who had never had any menstrual show. Her abdomen gradually distended until her condition called for an examination. The hymen was found

intact and was incised. There at once escaped a tawny-yellowish, serous liquid, which exhibited, under the microscope, the characteristic appearance of sero-pus, with some broken-down blood-cells. There was no discharge of blood, blood-clot, or tarry, black menstrual fluid. The distended passages were irrigated with a bi-chloride solution, and a rubber drainage-tube, of large calibre, was inserted. The girl made a good recovery. A. Sisman⁸_{June 5} had 3 cases of imperforate hymen, with accumulation of menstrual fluid in the genital passage. His patients were respectively 18, 19, and 23 years old. In each case a small incision in the middle of the hymen was made and a drainage-tube introduced, allowing the fluid to gradually drain away. The women all made good recoveries, and menstruated regularly afterward. L. N. Somers⁶_{May 10} reports the case of a girl who had been suffering for three years or more with headache, backache, sickness, constipation, flushings, loss of appetite, abdominal pains, swelling, and general discomfort. The symptoms usually appeared at the beginning of each month. She soon began to have epileptic seizures, which finally became so bad that she would have as many as five fits in two days. After general treatment had failed a local examination was insisted upon, and an imperforate hymen found. After free incision and quick evacuation the girl recovered her health, all the old symptoms left her, she had no more fits, and her menstruation became regular.

Injuries Due to Coition.—Sinaisky⁹⁶_{May} reports the case of a newly-married woman, aged 23 years, who stated that the first and only coition had given rise to an excruciating local pain and profuse bleeding, causing her to faint. The examination showed that the hymen was intact. The posterior commissure proved to be lacerated, the wound forming a funnel-shaped cavity admitting freely two or three fingers, and communicating with the rectum just above the anal sphincter; the vagina contained fecal gases and matter. There was also present a total rupture of the perineum running along the raphe, but involving only the skin and subcutaneous cellular tissues.

Doolittle³⁹_{May} relates the case of a young couple who had been married clandestinely. They came back to the house of the bride's mother and were together for about a half-hour, when the bridegroom left. In the morning the doctor was sent for, and found the girl blanched and with all the signs of the loss of a great deal of

blood. On examination he found the vagina filled with clots; on cleaning these away the hymen was found to be torn out to the depth of an eighth of an inch, but at the bottom of this tear blood spurted forth from a small artery from which the hæmorrhage had occurred. D. A. Sargent⁸⁵⁶_{Nov.} was called to see a woman, 26 years old, whose youngest child was 5 months old. She was suffering from a profuse hæmorrhage. A complete rent in the posterior portion of the vagina, about two and a half inches in length, was found. Both the woman and her husband stated that the bleeding began immediately after copulation. Smolitcheff⁹⁶_{Oct.} reports the case of a lady, aged 31 years, who applied to him on account of sacral and rectal pain and discharge of blood and fæces from her genitals, which symptoms had made their appearance during her first coition with her husband, twelve days previously. On examination, the major labia were found swollen and tender, the vaginal inlet totally closed with a red, unyielding, fleshy membrane, the posterior commissure ruptured, the wounds filled with blood and fæces. A forefinger pushed into the wound easily penetrated into the rectum to the depth of 7 centimetres. The said fleshy membrane proved to be an abnormally-developed hymen, with a median, linear, raphe-like groove and a minute orifice, scarcely admitting a probe, situated close to the urinary meatus. Spaeth²⁷_{Sept.} reports 3 cases: 1. Patient aged 31. During the first two days after marriage she had moderate pain during coition and insignificant bleeding thereafter; but later she experienced excessive pain during intercourse, and had the sensation as if the penis were forcing a wrong channel. Copious bleeding followed. Three days later flatus escaped from the vagina, and on the fourth day fæces. On examination the somewhat thickened columna rugarum posterior was found torn away from its attachments to the perineum. When lifted up by a tenaculum, a vaulted opening, with smooth edges and about the size of the little finger, was observed, from which fæcal masses protruded. It led to the rectum, as shown by a catheter introduced from the anus. The anterior rectal wall was perforated to about the breadth of two fingers. Case 2. Aged 28; underwent a severe instrumental labor, resulting in complete tear of the perineum deeply into the rectum. An operation was followed by uninterrupted healing. During the third night after her discharge she had profuse hæmorrhage, which was controlled by a

tampon. The next morning, on removing the tampon, a fresh hæmorrhage, from a tear in the vagina, about 3 centimetres wide, running transversely in the posterior vaginal wall at the site of its merging into the portio vaginalis was discovered. Case 3. Aged 28; first labor was followed by total perineal rupture. A subsequent operation was successful. Several days after leaving the hospital severe hæmorrhage took place. There was a transverse tear in the vagina at the posterior vault. The cause of the accident was proven to have been forbidden coitus. It is remarkable that in both these last cases the freshly-united tissues did not give way, but the vaginal vault ruptured both times.

Hofmohl⁵⁷_{Sept.8} says that in the past four years, in Vienna and Prague, there have been 4 cases of injury to the vagina following coition: 1. A woman 58 years old; the injury occurred in the vault of the vagina. 2. A woman 25 years old; the laceration was in the posterior part of the vaginal vault. 3. A woman 17 years old; the laceration was in the mucous membrane of the vaginal vault and was followed by severe hæmorrhage. 4. A woman 18 years old; the injury was a laceration of the mucous membrane of the entrance of the vagina. The genital tract was imperfectly developed. In all these cases there was profuse bleeding.

URETHRA.

Epispadias.—C. Rutherford⁵⁹_{Mar.1} was called to deliver a woman in labor. On attempting to catheterize the patient he failed, and an inspection of the parts revealed the meatus situated on the superior side of the clitoris and in a cleft between its crura. The crura of the clitoris, on its upper surface, were separated, the fibrous septum being deficient. The clitoris was of normal length and its free extremity was bifid for about $\frac{1}{3}$ inch. The external opening of the urethra was like a trough or shallow groove between the crura epispadias. The urethra passed below the symphysis of the pubis. K. P. Moore¹³⁹_{Nov.} believes that Emmet was eminently correct when he told the profession that the origin of many female troubles was to be found in the urethra. He directs attention to new growths and emphasizes the importance of thorough search into every case, even though there are no very decided symptoms, which are frequently not referred to the urethra and bladder. When they are found, excision, as complete as possible, is the

most effective means of cure. A 48-year-old married multipara consulted him for alleged uterine disease. She had suffered great pain for years and was almost a complete nervous wreck. She had visited many springs and health resorts and had been treated by numerous doctors for various diseases. An examination of the urethra disclosed on the inferior wall, and just within the meatus, a papillary angioma, not larger than a very small pea. This growth was very sensitive to the touch, and would bleed upon manipulation. There was a second similar growth a little to one side of the urethra and nearly $\frac{1}{2}$ inch behind the first.

Endoscopy.—Janovsky¹¹³_{Sept.7} has practiced endoscopy according to Grünfield's method in a large number of cases of gonorrhœa in the female, and has thus added considerably to our knowledge of the pathology of the disease. Examinations during the acute stage are difficult, it being necessary first to apply cocaine to the canal, on account of its sensitiveness. In acute gonorrhœa the mucous membrane is much swollen, with collections of pus between the folds. The walls may be covered with small abscesses. Skene's lacunæ contain pus in which gonococci can always be found. Erosions and circumscribed hæmorrhages are frequent. A peculiar herpetic form of urethritis (non-specific?), often seen in prostitutes, presents appearances similar to those observed in the subacute stage of gonorrhœa. Two varieties of the chronic form are to be distinguished, one of which, corresponding to chronic urethritis in the male, is represented endoscopically either by separate nodules or by diffuse swelling of the mucosa, or the glands and lacunæ may be principally affected. The granular form originates in the lacunæ.

Stricture.—Van de Warker⁶¹_{Oct.4} considers this condition a very common one, even more common than in the male. He does not refer to the spasmodic form, but to cases of a specific or traumatic origin. They are more likely to occur in multipara than in virgins. A true stricture should not be confounded with simple proliferation of the urethral mucous membrane. Stricture occurs most frequently near the meatus, and is not, in all respects, analogous to stricture in the male. One of small calibre in the male might give rise to no symptoms, while a similar one in the female might give rise to very positive symptoms. The best if not the only way of determining these strictures is by means of bulbous sounds, and the

same instruments should be used in treating it. It would sometimes require as large as a 30 (French) bulb for its relief. Such treatment is usually painful, and cocaine should be used. If the mucous membrane be everted, an exploration should be made, and, as the membrane is restored, an annular stricture at the meatus may become apparent. Dilatation should be gradual, the result being gradual absorption of the surrounding exudate, as well as rupture of the constricting bands. Treatment by electrolysis is painful and not more efficient than treatment with bulbs. It is a good plan to explore for stricture in all cases in which dysuria is present. In the normal condition the urethra will readily admit a 14 to 17 catheter.

Vascular Tumors.—Eve and Bidwell⁶_{Nor. 23, '90} report the case of a delicate girl, aged 6 years, who experienced pain in passing urine and some discharge from the vulva. There was a vascular tumor completely surrounding the urinary meatus and projecting from it about a quarter of an inch; its circumference was about the size of a hazel-nut. It was very painful to touch. Electrolysis was tried without affecting the size of the tumor. A week later it was completely removed with scissors, the hæmorrhage not being excessive. When seen last (about a month later) the child was quite free from any recurrence or stricture. Similar cases at such an early age are very rare.

Diverticula.—Routh²⁵_{June} says the symptoms of diverticula of the female urethra are progressive discomfort and frequency of micturition, dyspareunia, and the formation of a swelling which appears at the vaginal orifice. Pressure upon the swelling causes thin and offensive pus to pass into and out of the urethra. The diverticulum differs from dislocation of the urethra and from simple dilatation of that canal. It is essentially a urinary pouch or cyst, communicating usually with the middle third of a urethra of normal calibre by a narrow orifice. Etiology appears to be: 1. Closure of the ducts of pre-existing urethral glands, retention cysts resulting. Suppuration and ulceration into the urethra by a small hole follows, and the inflammation is kept up by urine trickling into the sac at each act of micturition. 2. Blood-cysts which have passed through similar changes. 3. The formation of pseudo-cysts by injury to the urethral floor during labor or instrumentation. Pregnancy, with its increased local activity, seems usually

to induce the formation of these cysts, and parturition appears to be often the immediate cause of the rupture. The *treatment* is mainly surgical: 1. *Where urethritis or cystitis exists*, the cyst-wall should be dissected out and cut off close to the urethra, and the vaginal wound left open for drainage. 2. *Where the urinary passages are healthy*, the cyst should be dissected out, the opening into the urethra enlarged to allow of drainage, and the vaginal wound at once closed. In either case the urine should be drawn off until union is assured. In examination a sound passed along the *anterior* wall of the urethra goes directly into the bladder, proving that the case is not one of urethral dislocation. To diagnose it from dilatation, pass a large-sized sound into the bladder, while a small one enters the opening (often valvular). With a bougie in the urethra the sac is felt to be quite distinct, and even when emptied by pressure it remains a thick-walled cyst. When full, these cysts vary in size from a pea to a hen's egg. After being emptied, it only partially refills at the next micturition, taking six or eight hours to become tense by exudation from its own lining membrane. Routh reports 3 cases.

Prolapse.—This affection was discussed at the Berlin Obstetrical and Gynæcological Society. Benicke²_{Apr. 12} described 3 cases. The first patient was 11 years old; the prolapse was slight and readily cured by the application of the actual cautery. In the second case the child was 10 years old and robust; the urethra was greatly dilated and the prolapse very marked; it was reduced and the meatus made narrow by means of one suture. The third patient was also 10 years old; the prolapse was extreme and irreducible. The protruding mucous membrane was cut away and the edges of the wound were successfully united by means of catgut sutures. Frequent severe hæmorrhage was the chief symptom in all these cases; dysuria and allied forms of suffering were absent. The causation of the prolapse could not be traced. C. Ruge and Martin believed that, as a rule, prolapse of the urethral mucous membrane was caused by the development of a vascular growth under the mucosa, which also underwent partial hypertrophy. Martin did not believe in treatment by caustics and cautery, which only gave occasional good results. Cutting off the prolapsed tissue sometimes caused the formation of a troublesome cicatrix, which contracted to a serious extent. Careful plastic proceedings gave

better results. Veit had never observed serious cicatricial contraction. The raw surface in a plastic operation might be cut so as to be circular, and also wedge-shaped at one point. Schröder had practiced a method of trimming the prolapsed tissue so as to prolong the meatus, but Martin observed that serious damage to the bladder had followed this practice. Prolapse of the urethral mucous membrane, which is in no way related to caruncle, although it contains angiomatous tissue, is certainly rare before puberty. Several distinguished authorities who joined in the discussion had never seen the disease in children.

Södermark ²_{Mar. 17} writes that 3 cases of prolapse in females came under his notice within three years, and he expressed surprise that it is usually described as very rare. He found that the disorder caused great discomfort. In one case the patient was 58 years old, and was also subject to prolapsus uteri, cystocele, and rectocele. A fleshy mass, the size of a walnut, partly sloughing, occupied the site of the urinary meatus. In the midst of the mass a depression led into the urethral channel. The entire outgrowth was removed with the galvano-cautery, whilst the vagina was narrowed anteriorly and posteriorly by a plastic operation. The result was satisfactory. The second patient had reached the age of 70. For several years a swelling, the size of a plum, consisting of the mucous membrane of the urethra, projected from the meatus. It was successfully removed with the galvano-cautery. The third patient was 9 years old, younger than any of the cases described by Benicke. The prolapse also consisted of the urethral mucosa. It was removed with scissors, and the edges of the raw surface left behind were united by sutures. Thus, prolapse of the urethral mucous membrane is not unknown in age and childhood. As to treatment, opinion is divided, for some have found that the cautery causes more cicatricial contraction than the knife or scissors, whilst others are led by experience to an opposite conclusion. Mundé ²⁷_{June} has had 2 cases under his care, 1 in an old woman of 75, the other in a child 9 years old. He says the disease is interesting not alone on account of its rarity, but also through its resemblance, on mere ocular examination, to a malignant tumor. It might also be easily taken for a large urethral caruncle. Correct diagnosis is readily made by searching for the meatus urina-rius with a sound, which will be found to enter a slit near the

centre, or slightly to one side of the centre, of the mass, and slip readily into the bladder. Both his cases were treated by trimming the protrusion off with scissors close to the edge of the meatus. The urethral mucous membrane was then stitched to the vestibular mucosa by a running suture of fine catgut. Both patients were well within ten days. In neither case did the history give any particular explanation of the cause.

Polyps and Hæmorrhoids.—Trépan²³⁰_{Dec., 89} reports the case of a patient 20 years old, who suffered from retention of urine for three days. Treatment relieved her, but micturition became painful. Her attending physician excised several polyps(?) from the urethra; this operation was followed by temporary relief. When she came into the hands of Trépan an examination showed vegetations at the meatus. The urethral canal was large, rough, and hard to the touch. The seat of the pain, which had returned, was situated 2 centimetres back of the meatus. The passage of sounds showed the pressure of a stricture at the seat of pain. Dilatation of the stricture failed to relieve the pain. The author states that a histological study of the small tumors, such as had been removed in this case, did not reveal true polypoid tissue. He believes the true condition to be that of hæmorrhoids. The most frequent causes of this hæmorrhoidal condition is pregnancy, antelexion of the uterus, myomatous uteri, and, in fact, any condition which may bring about undue pressure on the parts, especially at the neck of the bladder. He finds little success by excision. He is of the opinion that polyps are rare in this region, but that hæmorrhoids are of frequent occurrence.

Hyperæsthesia of Meatus.—Facien⁹¹_{Nov., '89} finds that the anatomical lesion of this symptom consists in a swelling of the mucous membrane, which is especially painful to the touch. He has observed 8 cases, and has successfully treated them by cutting the swollen and painful mucous membrane away with scissors and cauterizing the bleeding surfaces.

Villous Growths.—Strong⁹⁹_{July 17} reports an interesting case of this kind which he cured by medical treatment. He says the tendency to the formation of villous growths in chronic cystitis is rare, but even less common is it to meet with this condition in the urethra. He has seen it in but a single case, and in this associated with distinct fissure at the neck of the bladder and caruncle at the

meatus. The cause of the trouble here was evidently mechanical, the cervix of a retroverted and immovable uterus being crowded hard against the urethra.

BLADDER.

Calculi.—Strange³⁹_{July 16} refers to three methods of operating for vesical calculus: (1) crushing; (2) cutting (per vagina); (3) dilatation of urethra. He prefers dilatation, and reports 2 cases cured by dilatation in women 60 and 70 years old, respectively. In 1 case dribbling of urine continued for two weeks or more, but eventually ceased. Powell, in the discussion which followed, reported 2 cases in female children on whom he successfully operated by dilatation. One bladder contained three stones, the aggregate weight of which was 241 grains (15.61 grammes). Sullivan referred to a case where the stone was as large as the fist. It was crushed and removed as *débris*; and although the operation was tedious, the recovery was excellent.

Davenport⁹⁹_{Aug. 28} reports the case of a woman who had suffered for six years from a vesical calculus. He removed it by vaginal lithotomy. At the operation it was found that an incision 2 inches long, reaching from the neck of the bladder to the cervix, was not large enough to allow the stone to pass; so a second incision, $\frac{1}{2}$ inch in length, was made at right angles to it, beginning near the middle of the first incision. The fistula healed throughout by first intention. The patient has several times since held her urine between five and six hours, where formerly she suffered from continual incontinence. The stone was pure uric acid and weighed 1200 grains (77.75 grammes). Magruder¹³⁷_{Oct.} reports a case in which the stone was about 2 by 3 inches, and had caused a fistulous opening of $\frac{5}{8}$ inch in diameter in the vaginal wall. He removed it by enlarging the vesico-vaginal opening, and, as the stone seemed adherent, pieces of it had to be removed at a time, instead of by lifting it out of its pouch. Ransohoff¹²⁶_{Aug.} reports the case of a girl 5 years old who had suffered from dysuria for three years. A vesical calculus was diagnosed and removed by vaginal lithotomy. The vagina was dilated with a pair of forceps until the anterior wall was freely exposed to view. It was incised for a distance of $\frac{3}{4}$ inch, and through the aperture two uric-acid calculi, weighing together 101 grains (6.55 grammes), were removed. Twelve hours

after the operation the patient had complete control of the bladder, none of the urine escaping *per vaginam*. Pain on micturition had disappeared. The temperature at no time passed the normal. The author states that, while this case illustrates the facility with which vaginal lithotomy can be practiced in the very young for small stones, the operation displayed the defects of the method of removing large stones in very young girls. The danger in such cases from laceration of the bladder and permanent damage to the vagina must make the supra-pubic the ideal method. It seems to us that Ransohoff's own case fully disproves his theoretical opinion. No patient could make a quicker convalescence than his did, nor could a better result be expected. As a rule, vesical calculi do not become very large in young children before they are discovered. Even if they did, the case reported above by Davenport, an adult woman, shows how even the larger calculus may be removed easily and safely through the vaginal vault. We do not believe that the supra-pubic operation is ever necessary in females. Feleki^{2 Oct 1} reports the case of a woman, aged 57 years, who had complained for eight years of distressing dysuria. She was forced to arise as many as twenty times in a night, only to void a drop or two of urine, and always with great pain. These attacks lasted for several weeks at a time and ended, temporarily, in the passage of a smooth, hard body. The bladder was explored and a mass of calculi discovered and broken up and removed by litholapaxy. About two hundred pieces of calculus were taken away. Each entire calculus had a nucleus, or, rather, an axis, consisting of a fine hair (human), over an inch in length; some of the hairs were connected with three or four small stones, so as to form bead-like structures. The calculi were phosphatic and ranged from the size of a melon-seed to that of an almond. There was no evidence of the artificial introduction of hair into the bladder. The pelvic viscera were carefully searched, and no evidence of dermoid tumor in connection with the pelvic organ outside the bladder could be detected. This fact, coupled with the presence of the curious rows of calculi strung on single hairs, indicated that the original disease was trichiasis vesicæ (Payne), an "open dermoid," or growth of hair direct from the vesical mucous membrane. No other dermoid structure besides hair was at any time voided or extracted from the patient's bladder.

Cystitis.—W. C. Galloway ⁴³_{June} prefers the method of dilatation of the urethra and applications of glycerite of carbolic acid to the vesical mucous membrane in cystitis to all others. This procedure has been successful in his hands when all else had failed. He has had 5 or 6 successful cases.

Strong ⁹⁹_{July 17} finds a certain number of cases of chronic cystitis in which there are villous growths of the vesical mucous membrane, accompanied by hæmorrhage. Four of his cases had been diagnosed as malignant, and yet he effected a complete cure of them. His method of procedure is to introduce a finger into the bladder, followed by a sharp curette. With this instrument all the villous material is removed, and the bleeding is almost immediately stopped. The cases all made good recoveries. He thinks this procedure ought to do away with the necessity of establishing permanent fistulæ for drainage. Abbot ⁹⁹_{July 17} has treated cystitis successfully with salol, and thinks the drug should have an extended trial. Brun ²²_{Mar. 19} performed cystotomy through the vagina in a woman who was suffering from cystitis of a most rebellious nature, consecutive to an accouchement. The patient was much relieved. She returned a year later, complaining of great pain in the left kidney, and also in the corresponding ureter. An examination showed these organs the seat of a purulent inflammation, and it became necessary to remove the kidney. This operation proved successful, and the patient was well two years later. Brun considered the vesical drainage as being the best treatment for this class of cases, and the delay in making the vesico-vaginal fistulæ in this case nearly lost the patient her life.

Incontinence.—Saenger ⁹⁵_{B. 38, H. 2} treats many cases of this trouble by dilating the vesical sphincter. The technique of the operation is as follows: After cleansing the meatus with cotton, a disinfected metal catheter, preferably a female one, is introduced 5 to 7 centimetres into the bladder, so that its point is about at the ureteral orifices. The tip of the right index finger closes up the mouth of the catheter and holds it quietly in position. The index or middle finger of the other hand is laid upon the catheter at the meatus. This finger then makes forcible pressure, at first downward, then alternately toward both sides. The pressure must be springy, elastic, and powerful, so that the meatus becomes widely open and some urine flows off alongside the catheter. By this

pressure not only the sphincter vesicæ but the muscularis of the urethra become strongly stretched. In cases where it is possible to introduce a finger into the vagina, pressure can be made against the catheter. In very sensitive individuals cocaine may be used. The dilatation is altogether painless. From eight to twelve stretchings should be made in all three directions at a sitting. More than ten or twelve sittings are seldom necessary, at first done twice a day, then on alternate days. The patient is also instructed to gain control over the sphincter, to refrain from fluids as much as possible, and to keep the abdomen warm. The bowels should be regulated.

Strong ⁹⁹_{July 17} thinks that there is but one treatment for this,—steady and progressive dilatation by frequent hyperdistension with aseptic solutions. Systematically pursued, this will certainly effect a cure, although much time may be required.

Gersuny ³³⁶_{Nov. 25, 89} has devised a method for the treatment of that form of incontinence characterized by persistent dripping of urine, and due to disturbances of the function of the vesical sphincter. The operation consisted in partially separating the urethra from its attachments, leaving it well covered with its underlying structures, and twisting it in its long axis; it is then sutured again in position. The operation was performed three times upon one patient (a young female), the torsion not being sufficient in the first two attempts. The amount of torsion finally amounted in all to one and a quarter turns. The patient reported, six months afterward, that she could retain the bladder-contents for five hours, and that fully four minutes were occupied in passing a pint of urine.

Stuart-Nairne ⁴¹_{Sept. 18} found in 2 cases a floating membrane in the urethra extending out from the bladder. The function of the vesical sphincter was interfered with, and there was incontinence of urine. He excised the membranes and cauterized their base, thereby curing his patients.

Foreign Bodies.—The reports of foreign bodies found in the vagina and bladder of females from time to time are surprisingly numerous. Aldibert ¹¹⁸_{Mar.} reports the case of a girl who at 12½ years of age first menstruated, the flow lasting eight days. She acknowledged to having at this time introduced a hair-pin into the bladder. Later, all the symptoms of cystitis and masturbation

developed. An examination revealed a vesical calculus. It was removed by rapid dilatation of the urethra. It proved to be a phosphatic stone with the hair-pin imbedded in it.

Desnos¹⁷_{June 26} reports 2 cases of vesical calculi with hair-pins as a nucleus. The first he removed by vaginal lithotomy. The wound became infected and sloughed. A secondary operation closed the resulting fistula. In both cases the bladder tolerated large foreign bodies without causing cystitis. He considers the relative merits of dilatation of the urethra and vaginal lithotomy, only to decide in favor of the vesico-vaginal fistula. After dilatation, while trying to grasp the foreign body, the walls of the bladder are likely to contract and interfere seriously with the manipulation.

Vergely¹⁸⁸_{Aug. 17} treated a woman with symptoms of cystitis. A sound revealed calculous concretions in the wall of the bladder. The operation of vaginal lithotomy was performed, and, together with the calculi, he removed a piece of thread and a piece of copper, the copper proving to have been a portion of a gas-fixture.

Ellison²⁷_{Feb.} found a "common spool" in the bladder of one of his female patients. She acknowledged to having introduced it into the vagina just previous to the first menstruation. It had ulcerated its way into the bladder, and had become the nucleus of a large phosphatic calculus. One of the noticeable features of this case was that the menstrual flow made its exit through the opening made by the spool into the bladder and out through the urethra. The pathological changes in the vagina, resulting from the presence of the foreign body, had closed the vagina below the spool before the fistulous opening was made in the bladder, thus preventing incontinence.

Köhler³¹⁷_{No. 6} reports the case of a servant-girl who had fallen off a ladder on to a burning lamp, the chimney entering the perineum. A week afterward, on examination with a catheter, fragments of glass were felt in the bladder. They were extracted through the urethra, fourteen in number, the largest being 2 inches long and 1 inch wide. The patient died of sepsis. The fragments, which constituted almost the entire chimney, must have passed into the bladder *in toto*, and then broken, as it would have been impossible for all the fragments to reach the bladder through a distance of nearly 3 inches.

Pamard²²_{Apr.30} produced a pencil 4 inches in length which he removed from the bladder of an unmarried woman aged 34. The foreign body was at first tolerated, but soon grave results followed: incontinence of urine, intolerable pain, and finally perforation of the vesico-vaginal wall. When extracted the pencil was incrustated, and two large calculi were attached to one extremity. The patient did very well, but was attacked by influenza and quickly succumbed. The autopsy showed that the bladder was perforated by the point of the pencil, and a loop of the small intestine was eroded by the contact. If the patient had delayed the operation much longer the intestine would have been perforated.

Kézmárszky⁴¹_{Jan.9} recommends gradual dilatation of the urethra and the introduction of one finger into the bladder for exploration. After making up his mind that there is a foreign body present, he passes a pair of forceps into the urethra, using the finger as a guide, and so extracts the offending body. By this procedure he removed a small piece of iron from the bladder of a female patient.

Fissure of Neck.—Decès⁵⁷⁷_{Jan.} reports 2 cases of this disease. The first patient suffered principally from painful micturition. The sound caused great pain as it passed the neck of the bladder. The case was completely cured by dilating the urethral canal, together with the neck of the bladder. The second case had incontinence of urine and painful micturition for four or five days at a time. Between these attacks there were intervals of relief. The same treatment as in the first case produced a cure.

Papilloma.—Palmer¹¹⁷_{Aug.} had 4 cases. The first one was a woman 50 years old, who first began to complain of bloody urine. Micturition soon became frequent; the urine was acid, contained mucus, and was somewhat albuminous; the symptoms gradually increased, in spite of all treatment. A growth was finally made out on the anterior wall of the bladder about the size of an ordinary hickory-nut; a finger was passed through the urethra and the growth forcibly removed with the finger-nail. Microscopical examination proved it to be papilloma. The patient improved rapidly up to a certain point and then began to relapse, until within a year she was as bad as ever. The bladder was now opened through the vesico-vaginal septum and the walls thoroughly cleared from the soft, friable projections with which it was covered. The site of the old growth was found to be healthy. No attempt

was made to close the opening into the vagina. Two years after the second operation the patient died from an extension of the disease involving the whole bladder. The second patient was 17 years old. Her symptoms were much the same as those of the first patient. A tumor the size of an almond was found on the posterior vesical wall. The patient was placed on a mixture of—

R Acidi boracici, ʒj (4 grammes).
Tinct. hyoscyami, ʒss (16 grammes).
Infus. buchu, ʒiiss (48 grammes).
M. Sig.: One teaspoonful every three hours.

The bladder was washed out every other day with a hot saturated solution of boric acid. The patient improved rapidly and left the hospital at the end of a month, the tumor having entirely disappeared. Palmer had 2 similar cases, and both recovered completely under the same treatment. The symptom of most important pathological significance is the hæmorrhage. Palmer claims that he has cured 3 out of 4 cases, and with a treatment which would, on the face of it, appear not very effective. It must be borne in mind, however, that in not 1 of the 3 cases he cured did he verify his diagnosis either by a visual or a microscopical examination.

Epithelioma.—Marsh_{July 5}⁶ had a case of this kind in a woman 55 years old. The growth, an ulcerated one, was localized at the summit of the bladder, almost in the median line. The whole tumor was resected, together with a piece of the peritoneum, through a supra-pubic incision. The peritoneal wound was closed and the bladder-wound left open, with a drainage-tube leading down to it. The patient died in two days and a half after operation. Gilbert Barling_{Mar.}³² states that only 5 cases of formal resection of the bladder-wall for the radical cure of carcinoma have been recorded, viz., 1 each by Bruce, Clarke, Sonnenburg, and Antal, and 2 by Guyon. Of these cases 2 only could be said to have recovered from the effects of the operation, 1 living twelve months and the other four years, local recurrence taking place in each. So far the results are not encouraging, the 6 cases showing a mortality of 66 per cent. and not one permanent cure.

Tubercular Ulceration.—Battle_{May}² reports the case of a woman who suffered from general bladder symptoms. The diagnosis was only made after urethral dilatation and digital exploration. The

ulcerative process resisted every method of treatment, and only yielded finally to a thorough curetting through a supra-pubic incision. The patient left the hospital on the fifty-third day and presented herself again some months later in good health. Examination of the granulation tissue removed at the operation showed caseous degeneration of tubercular deposit; no bacilli were found, nor could any be found in the urine, though this was examined on more than one occasion. Fenwick, in discussing this paper, thought Battle's case open to three objections, which referred respectively to the diagnosis, the prognosis, and the treatment. As to the diagnosis, two strong links were wanting: one was the absence, or not demonstrated presence, of the bacillus tuberculosis, which was so often found in the discharge from these ulcers that no stone should be left unturned in its discovery. Then, as to the cystoscope, he did not think it possible to diagnose by that instrument alone tuberculous from scrofulous ulcers. Nor must all ulcerations be diagnosed as tubercular because they did not heal at once. Then, as to prognosis, he thought that given by Battle was somewhat sanguine, seeing that these cases had a fallacious periodicity of active and arrested evolution; and whilst most cases of tubercular ulceration died in three years, those of scrofulous disease went on for ten, fifteen, or even twenty years before ending. Finally, as to treatment, he thought that, with a female patient, a surgeon could, by dilating the urethra, treat the ulceration with applications of all kinds, as a dentist treated a carious cavity in a tooth. He was accustomed to use lactic acid for such a purpose, and found the ulcers heal in the course of a few months. He mopped a 5-per-cent. solution onto the ulcer, or injected one of 1 per cent. into the bladder. He brought forward a table of 50 cases of tuberculous ulceration of the bladder.

Gangrene.—Haultain ^{49 36}_{Feb.; June} has carefully analyzed 53 reported cases of vesical gangrene. His deductions are as follow: 1. This condition consists in necrosis of the wall of the bladder, due to coagulation and exudation. 2. The process may affect the epithelial layer alone, it may be limited to the mucosa and submucosa, or it may involve all the layers. 3. It is always due either to prolonged retention or to parturition. 4. It is directly due to pressure on the neck and base of the bladder, with resulting interference with the circulation.

The protrusion of the whole or part of the mucous membrane of the bladder from the urethra is a most alarming symptom, and the practitioner will naturally wish to know what is likely to result from the exfoliation, and what ought to be done. Hence we may note his observations on "prognosis": out of 53 collected cases of necrosis of the bladder in the female, but 25 ended fatally; in 29 exfoliation took place, with only 11 deaths,—an almost incredibly low percentage, especially when it is taken into consideration that in at least 6 of the recoveries the entire thickness of the bladder-wall was cast off, portions of peritoneum being found on the external surface of the sac. The prognosis as to complete recovery and restoration of the bladder to its normal functions is less favorable. In the large majority of cases, more or less incontinence of urine was observed. In some cases a certain amount of sphincter action seems to have been left, retention of urine being possible for short periods, even for as long as two hours in a case recorded by Sir Spencer Wells. Haultain advises that when the exfoliating sac protrudes from the urethra a catheter should be passed, so as to empty the bladder slowly and diagnose the condition from inversion of the bladder. The sac is then removed and the bladder washed out with a strong antiseptic solution, repeated every four hours till the temperature falls below 101° F. (38.33° C.), after which the washing is to be continued at more lengthened intervals till the lotion returns pure. Constant drainage of the bladder is necessary, should there be the slightest tendency to retention of urine.

Total Extirpation.—Pawlik²⁷_{Oct.} reports the case of a patient, aged 40 years, who began to suffer in June, 1888, from hæmaturia, the cause of which was a pedunculated papilloma of the bladder, which Panas removed after making an artificial vesico-vaginal fistula. A year later very numerous relapses occurred, which were malignant in character and therefore required a radical operation. In order to be able to remove the entire bladder Pawlik proceeded as follows: He first conducted the ureters into the vagina by sounding them in the manner recommended by him, dissecting them out, splitting them, and stitching them to the vaginal wall. The second step of the operation, after the lapse of some time, was the extirpation of the bladder. An incision was made above the symphysis without opening the peritoneum; then the entire bladder was shelled out from the cellular tissue as far as the urethra with-

out the use of cutting instruments. The cavity left was stuffed with iodoform gauze. The operation was then continued from the vagina, whose anterior wall was divided transversely and the rest of the bladder cut off from the urethra. After this the anterior vaginal wall was stitched to the anterior margin of the urethra, the posterior wall to the posterior margin, thus making the urethra terminate in the vagina. This suture did not heal completely. In a following operation, therefore, the closure of the vulva was made in a longitudinal direction. At present it is closed with the exception of a small fistula. The patient was presented to demonstrate the result of this hazardous operation.

Instruments.—Küstner³¹⁷_{Nov.23} recommends that a female catheter be made of glass, be a straight tube, and be opened at both ends. Such an instrument can be kept clean without any difficulty and assures the prevention of cystitis. Worrall²_{Oct.18} claims that he has used such an instrument for some time, having described it in a paper read December, 1889. The only difference between his and Küstner's instrument is that 1 inch from the distal end his is bent down at right angles to the shaft. The advantages of such an improvement are obvious.

FISTULÆ.

Vesico-Vaginal. — McGill⁶_{Nov.8} says an operation for vesico-vaginal fistula through a supra-pubic wound in the bladder was first suggested by Trendelenburg. He has himself operated twice in this way. The first case was one of epithelioma, involving the floor of the urethra for its whole length as well as part of the anterior vaginal wall and base of the bladder. The opening made in removing the growth was large, and a fistulous opening resulted; this closed spontaneously five weeks later. The second case, in which the result was perfectly satisfactory, was an ordinary one following labor. He lays down the following rules for the performance of the operation: 1. The patient is placed in the inverted position. 2. A longitudinal incision is to be made in the bladder, in spite of the fact that he used for both his cases a transverse incision. 3. The bladder must be fixed by sutures to the deeper layers of the abdominal wall. 4. In freshening the edges of the fistula, care must be taken to remove a complete ring of vesical mucous membrane, and of the bladder and vaginal walls. 5. Fine catgut sutures are passed through the mucous membrane from

above, and, the patient being placed in the lithotomy position, silk sutures are introduced through the vaginal wall from below. 6. Supra-pubic drainage must be maintained until the fistula is firmly closed.

Brownson, according to a private communication, in closing a vesico-vaginal fistula, after making his denudation in the ordinary way, stitched the edges of the mucous membrane of the bladder together with catgut, then passed the silver-wire sutures in the ordinary way. He thinks the catgut knot may possibly not become absorbed and may subsequently become the nucleus for a calculus. This, however, remains to be proven practically. T. L. Burnett,⁶⁶³_{Sept.} in a case of vesico-vaginal fistula, after placing the patient in the Sims position, removed the tissue surrounding the opening, leaving the form of an ellipse, thus allowing the edges when brought together to form a straight line. A continuous suture of catgut then brought the edges of the wound in the bladder in apposition, care being taken not to involve any of the tissue of the vaginal wall proper, which was subsequently dissected up for a quarter of an inch on both sides of this suture, thus allowing it to be slid to one side and to be retained in this position by a line of deep silk sutures rendering the closure of the wound water-tight from the first. He believes the double line of sutures to be a double security, and that one line of union assists the other in forming permanent closure of the opening. Catgut has proven, to his satisfaction, that it is sufficient for the buried suture, and silk, in this operation, as in all others, more desirable than silver wire.

Trendelenburg,⁸_{Apr. 10} says that at present the principle of operations for vesico-vaginal fistulae is the same in all cases. The edges of the fistula are freshened, sutures introduced from the vagina, and the denuded edges brought into apposition. In especially difficult cases which cannot be cured by this principle, he has sought for another way of operating and found (1) that fistulae which cannot be easily gotten at from the vagina can be reached, the edges freshened and brought together successfully by stitches, from the bladder; (2) that fistulae which could not be closed by direct union of the edges, under certain circumstances could be united by a flap from the posterior vaginal wall.

Tait²⁶_{Feb.} operated on a vesico-vaginal fistula as follows: He made the margins of the hole tense by means of two sharp hooks,

and then made an incision into the margin of the aperture for about $\frac{2}{3}$ inch in depth, in such a manner as to split the part of the septum immediately around the fistula into a vesical and a vaginal portion. On separating these two portions a zone of raw tissue surrounded the opening. Silkworm-gut sutures were next passed in such a way as to bring into apposition the raw tissue on opposite sides of the opening. The fistula was so large that it was found impossible to close the whole of it at one operation. Some time after this she began to have severe pain in the side of the abdomen and a swelling appeared as large as an orange. After three weeks of extreme suffering, large quantities of pus appeared in the urine, which dribbled away through the fistula. An examination showed a suppurating kidney, which was laid open and a quantity of stones and pus evacuated. The patient was recovering when last heard from.

Recto-Vesical.—Rose²²_{June 4} reports the case of a woman (the second in his practice) who presented an obscure history of a calculus in the bladder, for which she had been treated eleven years ago, since which time she had suffered from involuntary discharge of urine and *faeces per vaginam*, the *faeces* occasionally passing into the bladder. An examination discovered fistulous communications between the bladder, rectum, and vagina. Much dense cicatricial tissue was found. Owing to the complicated nature of the case and the difficulty in reaching the openings even with the tip of the finger, together with the intense pain and distress of the patient, the operation of inguinal colotomy seemed to hold out the best prospect of at least partial relief. This operation was successfully performed, and at some future time the attempt will be made to close the fistulous openings in the vagina. Herczel¹⁶⁹_{Jan.} reports 2 cases from the clinic of Czerny. The first one was operated upon successfully, but the second was a failure, and a colotomy was necessary as a palliative measure. Iakovleff⁹⁶_{Oct.} reports the case of a woman suffering from a recto-vesical fistula, with contraction of the vagina to such an extent that an operation for closure of the fistula could not be successfully performed. He, therefore, proceeded to completely close the vulva. The operation was a success and the woman voided her urine from the rectum. There was no uncontrollable irritation of the rectum. Iakovleff says that this is the sixth case of episioceleisis in international literature; the pre-

ceding 5 were communicated by Baker, Brown, K. F. Slaviansky, Gerasimovitch, and Crespi.

Instruments.—Joye ^{July 13} has invented a pair of forceps to be used in operations of vesico-vaginal fistula. The accompanying cut will well illustrate their appearance and application.

Ileo-Vaginal.—Burton ^{May 28} had a patient who had been delivered with the forceps, and forty-eight hours afterward feces passed



JOYE'S FORCEPS FOR VESICO-VAGINAL FISTULA.
(*New York Medical Journal.*)

through the vagina. The fistulous opening was found in the posterior vaginal vault. The patient emaciated rapidly in spite of a good appetite. An abdominal section was subsequently performed and the fistula found to be in the small intestine, 4 inches from the cæcum. It was resected 4 inches beyond the point of adhesion, and both free ends invaginated; the ileum was then approximated to the colon above the cæcum by means of Senn's bone plates. The patient made a complete recovery.

Recto-Vaginal.—Le Dentu³¹_{Oct.9} has devised what, he thinks, is an easy method of repair of recto-vaginal fistulae which resist other methods or are too insignificant to demand splitting of the sphincter ani. The steps of the operation, which the accompanying drawings will make more plain, are as follow: 1. Pass the index finger into the rectum. 2. Make a curved incision passing 1 centimetre above the fistula and a second one passing just below and touching it. The included surface, A C B, is to be freshened (see

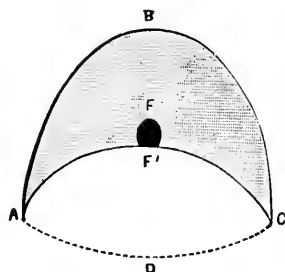


FIG. 1.

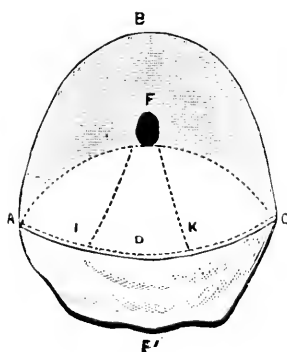


FIG. 2.

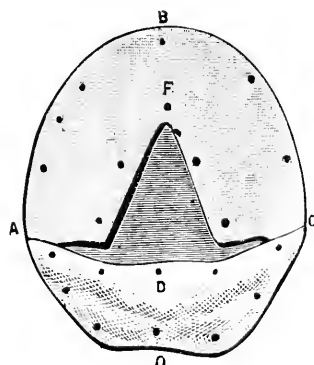


FIG. 3.

LE DENTU'S OPERATION FOR RECTO-VAGINAL FISTULA.

(*La Médecine Moderne.*)

Fig. 1). 3. Dissect up flap from the line A F' C (Fig. 1), with the dotted line A D C for a base, and turn this flap down toward the anus. 4. Slip up the dissected flap, A F' C D (Fig. 1), far enough to cover the denuded surface, A B C F. This leaves a *cul-de-sac* at lower end of flap. 5. The triangle (Fig. 2) F I K is cut out of the recto-vaginal septum, making a large recto-vaginal fistula, triangular in shape (Fig. 3). 6. Silver wire or silk (ten sutures) is passed under the upper and denuded surface, A B C F (Fig. 3), introducing needle at B and coming out at F. The suture is

threaded at both ends with a needle. The needle on the upper end of the suture (at the point B) is introduced into the dissected flap, A D C O, at point D. The second needle, on the lower end of the suture (at point F), is passed through the same lower flap at O. The other sutures are placed one on each side of this first and central one. After all are introduced the flap is turned up and the sutures tied.

Urethro-Vaginal.—Christie²⁸⁴_{July} reports a case of fistula between the vagina and urethra, which followed a prolonged and difficult labor. The patient suffered from painful micturition and dribbling of urine after and during urination. The fistula was successfully repaired by denuding the edges of the vagina and passing the sutures so as not to penetrate the urethral mucous membrane.

Vesico-Utero-Vaginal.—Coe⁵_{May} gives the subsequent report of a patient on whom he performed an amputation of the uterus for rupture of this organ during labor. The woman recovered from this first operation, with constant dribbling of urine from the vagina, accompanied by all its discomforts. A fistula was found involving the bladder, cervical canal, and vagina. An operation was performed, the patient being under ether an hour and three-quarters. Coe first divided the bridge of cicatricial tissue between the fistula and the remains of the cervical canal, thus forming one large opening. The edges of the fistula were pared and the entire portio vaginalis was then excised, so that nothing but vaginal mucous membrane would be included in the sutures along the entire line of the wound. It was necessary to dissect off a good deal of cicatricial tissue along the edges of the fistula proper, since in the healing process there had occurred an *inversion* of the vaginal mucosa, instead of the usual eversion of the vesical.

The opening of the ureter was next identified in the upper edge of the fistula, and was carefully located by introducing a fine probe into it. Before passing the sutures (thirteen wire and three silk) tension was still further relieved by splitting the vesico-vaginal septum to the distance of $\frac{1}{4}$ inch along the upper edge of the fistula. The sutures were introduced in the usual manner with considerable difficulty, the bladder was irrigated with a weak solution of carbolic acid, and a soft-rubber catheter was left *in situ*. The patient made a good recovery, and has complete control of her urine.

PERINEUM.

Sutures.—Ashby¹⁰⁴_{May 18, '89} thinks that silver wire would be a perfect suture for operation about the genital canal, if it were not for the fact that it is non-absorbable. This being the case, he prefers the animal suture. With its use he has failed to get good union in no case. The patients are kept upon their backs for ten days, and at the end of this time repair has taken place and the suture is absorbed. The two claims he makes for this material are that it is non-irritable and it is self-removable. It has been claimed that it is less easily adjusted than silver wire, that the edges of the flaps approximate with less neatness and ease of manipulation, and that the knot is liable to slip or loosen in attempts to tie. All this can be easily obviated by care. The catgut suture will hold *in situ* from four to fourteen days. Cases of vesico- and recto-vaginal fistulæ he thinks are exceptions to the rule. In these cases silver wire should always be used.

Rectocele.—McLean²⁹_{Feb.} removed a suture of silkworm-gut which had remained in the recto-vaginal septum for three years, keeping up a fistulous opening and exfoliation of tissue, which gave rise to the suspicion of epithelioma. Emmet²⁷_{July} describes his well-known operation

for its repair. He states that any operation for closing a “lacerated perineum” which includes the recto-vaginal wall is but a modification of the operation devised and perfected by himself. To J. Marion Sims is due the credit of devising the two operations described by Mundé²⁷_{Mar.} as “Stoltz’s” and “Hegar’s” operations.

Secondary Operations.—Edebohl²⁷_{Oct.} has settled into the method of flap-splitting for lacerations of the perineum. The denudation, as practiced by him, is the ordinary one in use, and the result is shown in the accompanying figures.

Four sutures are generally required, the first suture uniting the apices of the wound, A E and A' E', the second B F to B' F', the third C G to C' G', the fourth D H to D' H'. The sutures run parallel and are similar to each other, and a description of one will apply to all.

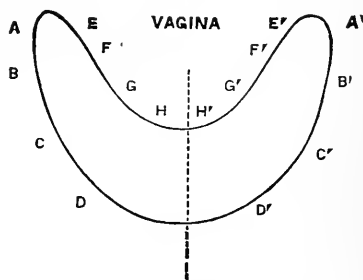


FIG. 1.—EDEBOHL'S FLAP-SPLITTING OPERATION.

(*American Journal of Obstetrics.*)

Each suture is passed as follows: A strong strand of silk-worm-gut is threaded upon a curved needle of semicircular shape. The needle, securely held by a needle-holder, penetrates the skin (1, Fig. 2) to the left of the wound, $\frac{3}{4}$ to 1 inch from the margin of the latter. It is carried in a semicircular sweep through all the intervening tissues into the vagina, where it emerges at a point (2) $\frac{3}{4}$ to 1 inch from the margin of the wound. It is carried on in the vagina, and again pierces the walls of the latter at a point (3) distant $\frac{1}{4}$ inch from the wound margin. It travels along beneath the mucous membrane and emerges on the wound surface at 4, just beneath the edge of the mucous membrane. The needle is now carried across the vulvar orifice, and enters the wound of the right side beneath the cut edge of the mucous membrane at a point (5) corresponding to 4 of the left side. It

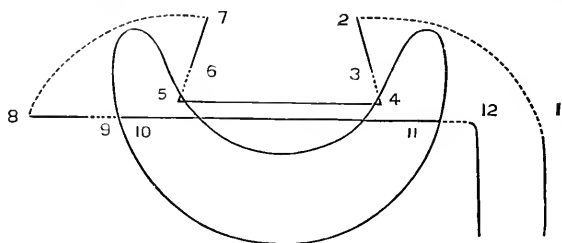


FIG. 2.—EDEBOHL'S FLAP-SPLITTING OPERATION.
(*American Journal of Obstetrics.*)

emerges upon the vaginal wall $\frac{1}{4}$ inch from the wound margin, re-enters the vaginal wall at 7, $\frac{1}{2}$ to $\frac{3}{4}$ inch further on, again sweeps through all the tissues between vagina and skin, emerging upon the perineum $\frac{3}{4}$ to 1 inch from the margin of the cutaneous wound (8). After the four sutures have been passed thus far, the ends pendent at 8 are re-threaded upon a short, straight needle, carried through the skin at 9, $\frac{1}{4}$ inch distant from the wound margin, thence along just beneath the skin, emerging upon the wound at 10, just within the skin, re-entering the opposite surface at 11, and emerging upon the skin at 12. The two free ends at 1 and 12 are drawn up and tied.

The popularity of the flap-splitting method of repair of the perineum still continues to increase. Most surgeons stick more or less closely to the principles laid down by Tait, and yet there is a noticeable inclination to somewhat modify the details. Ross ³⁹
Aug. 16

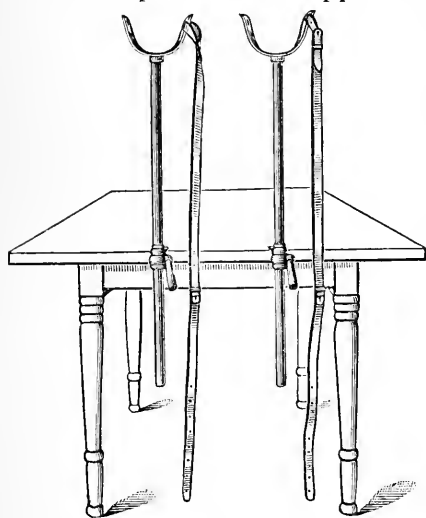
reports 2 cases of complete lacerations and many incomplete ones repaired by this method. W. Krause⁸⁴⁴_{July 26} reports 30 cases repaired on this principle; 27 were incomplete and 3 complete lacerations. Johnston⁶⁴⁷_{Apr.} recommends it highly, and claims that it will restore a woman to an almost virginal condition. Peters⁸_{Feb. 20} refers to 2 cases. Rodzevich¹⁰⁸⁰_{'89} gives a series of 36 cases, 2 of which he says were complete tears. He says all other operations, if not successful, leave the patient in a worse state than she was before. Törngren⁴⁹⁸_{Feb.} has had 14 consecutive cases. He operates under local anæsthesia (cocaine). Barnes²_{Sept. 13} after an increased experience, is still of the opinion that this operation is the best. Hanks²⁷_{Oct.} after an experience of four years with this method, is convinced that it is the most simple, most expeditious, and most safe in its results. Deroubaix⁵²_{Dec., '89} rejects all operations which borrow tissue from neighboring parts to substitute for the loss in the torn perineum. For this, as well as practical reasons, he rejects the flap-splitting operation. He approves entirely of the principles involved in the Emmet operation. Von Ott⁹⁵_{II. 20, II. 1} says that Tait's method is contrary to normal anatomical conditions, and hence the advantages claimed for it of simplicity and rapidity of execution have no real value. He further says that in 36 cases operated upon by Rodsewitsch, 12 (or $\frac{1}{3}$ of the total number) resulted badly and that the result of such an experience cannot be overlooked. We would again refer to the bad results obtained by Parvin and Mundé, to which attention was called in the 1890 issue of the ANNUAL, vol. ii, H-16, and also to the opinion of Saenger, after an experience of 71 cases, that he is not sure it is preferable to the older method. Warzberg²⁶_{Feb.} reports a new method of operating for ruptured perineum. It only applies to complete lacerations involving the recto-vaginal septum at a high level. A dissection is made to the depth of 1 centimetre, and the vaginal and rectal mucous membrane are carefully separated, beginning at the highest part of the laceration and extending downward until the extremities of the torn sphincter became lost in the cicatrix. From this a transverse incision is made, perpendicularly from its external extremity, in a direction parallel with the perineum as far as the junction of the greater and lesser labia, about 10 centimetres. This vaginal flap is in turn dissected and raised up. The sutures are then inserted on the rectal side, the whole extent of the tear, by Lauenstein's

method. Thus the very slightly aseptic rectum is perfectly isolated from the rest of the wound and favors union by first intention. A series of graduated sutures brings the soft parts together and prevents tension. Then the vaginal flaps are easily united by a continuous suture, and, lastly, from three to five sutures re-constitute the perineum. The sutures are of catgut.

Primary Operations.—Noble²⁰²_{Oct. 25} writes that perineal lacerations should be closed at once. The contra-indications for the immediate operation are: post-partum hæmorrhage, eclampsia, and extensive bruising. The success depends upon maintaining asepsis and upon correct approximation. In his own experience,

90 per cent. of such operations yielded good results. Lebou²⁵⁶_{Mar. 30} also recommends immediate operation in perineal laceration.

Frost-Bite.—Teplashin⁴⁹_{Aug.} reports the case of a peasant woman who walked $\frac{3}{4}$ mile through a severe snow-storm to the hospital. At every pain she sat down in the snow. She was delivered that same night, and the next day the lower parts of the buttocks and labia major were found severely frost-bitten. The parts sloughed, but the woman finally recovered.



WILE'S LEG-HOLDER.
(*Journal American Medical Association.*)

Leg-Holder.—Wile⁶¹_{Feb. 16, '99} has invented an instrument for holding the legs of a patient in position during operations on the perineum, thus enabling one to dispense with assistants. This instrument (see cut) is placed in position only after the patient is put under anæsthesia, and on the top concave bar rests the belly of the gastrocnemius muscle, while in slots on each side of this is inserted a strap which passes around the sole of the foot, keeping the leg from slipping down, which would cause undue pressure on the popliteal artery under the knee-joint.

VULVA.

Pruritus Vulvæ.—Idiopathic pruritus of the vagina and vulva, without any recognized abnormal condition, is extremely

rare, and its existence is even denied by some (Hildebrandt, Zweifel, etc.); 2 cases are reported by Feinberg.³¹⁷_{Feb.15} The first, a I-para, had suffered with pruritus before her pregnancy, with exacerbations at the menstrual periods. Her sufferings became excessive at the time of labor, and the itching spread to the entire surface of the body. Local anæsthetics were necessary in order to make an examination. Forceps were applied, and a healthy child extracted. Four days later the pruritus suddenly disappeared. No local or constitutional disease could be discovered. Case 2 was IV-para, with a similar history of exacerbation of distress at the menstrual periods. The patient aborted, and with the appearance of the labor-pains the pruritus became general. Although in both of these cases no assignable cause could be discovered, it is probable that there existed some local lesion or some abnormality in the menstrual or vaginal fluid.

Sauer⁷²_{Mar.} recommends especial attention to internal medication: for irregular menstruation, steel, codliver-oil, quinine, and strychnine; for nervous irritation, the bromides and chloral, alone or in combination. Morphia, he asserts, aggravates the pruritus, and must be avoided. Albutt¹²⁹_{Mar.} reports considerable amelioration from the use of a granule of aconitine, veratrine, and hydroferrocyanate of quinine every hour, with nourishing food and out-door exercise; while Wertheimer⁶¹_{Aug.15} reports a cure from the use of 15 grains (1 gramme) of salicylate of sodium three times a day. Locally, Mussey³⁵_{Jan.16,'99} prescribes, in chronic cases, an ointment of the glyceride of starch, 5 drachms (20 grammes); potassium bromide and subnitrate of bismuth, each 15 grains (1 gramme); calomel, 6 grains (0.40 gramme), and extract of belladonna, 3 grains (0.20 gramme), or a lotion containing 10 parts of sodium borate to 50 parts of cherry-laurel water and 1000 parts of infusion of marsh-mallow.

Vulvar Hypertrophies.—R. W. Taylor¹_{Jan 4,'99} has contributed an admirable paper upon this subject. From a consideration of several hundred cases of hypertrophies and many thousands of other miscellaneous vulvar affections, he concludes that the chronic forms of inflammation of the vulva, associated with infiltration and ulceration of the parts, are due: “1. In the greater number of cases, to simple hyperplasia of the tissues induced by irritating causes, inflammation, and traumatisms. 2. That chronic chancreoid is a cause in a certain proportion of cases. 3. That many

cases are due to essential and specific syphilitic infiltrations. 4. That other cases are caused by the hard œdema which often complicates and surrounds the initial sclerosis, and, perhaps, gummatous infiltration. 5. That many cases are due to simple hyperplasia in old syphilitic subjects who suffer from chronic ulceration of the vulva long after all specific lesions have departed. 6. That some cases, also in old syphilitics, are due to simple hyperplasia without the existence of any concomitant ulcerative or infiltrative process, and seem to be caused by conditions which, usually in healthy persons, only result in vulvar inflammation."

He claims that his experience proves that the majority of these vulvar lesions are in no way specific or lupous in their nature, but simply hyperplasiæ, which, owing to their situation, have undergone various changes. Among the exciting causes he groups "vulvar inflammation, whether simple or the outcome of antecedent chaneroids, elytritis, herpes progenitalis, leucorrhœa, gonorrhœa, uncleanness, masturbation, tears in coitus and parturition, scratches, cuts, bruises, eczema, and all forms of traumatism." In some of the cases there is simply enlargement of the natural parts, but in the majority there is more or less deformity, and even distortion.

He describes a form of hypertrophy of the vulvo-anal region which has not hitherto been mentioned by authors. This consists in an initial development of simple vegetations over the external genitals, which, from neglect as to cleanliness and surgical intervention, increase in size and number. "As they grow in height and breadth, particularly those on the outer portions of the labia majora (where they are subject to continuous friction), they lose their warty appearance and come to look like nodules, processes, or tabs of skin. They are, as it were, polished off, losing entirely their granular, raspberry-like look, and taking on the appearance of integument. Unless ablated, these tumors inevitably lead to great hypertrophy and disfigurement of the parts. They, acting as low-grade inflammatory foci, induce hyperæmia and hyperplasia in the vulva, and in the end lead to its great distortion."

The pathology of the condition consists in a very moderate degree of change in the epidermis; a slight deepening of the inter-papillary portions, and a thinning of the epidermis over the apices of the papillæ. In the derma there are changes in the blood-vessels,

lymph-spaces, and connective-tissue cells. The latter are increased in number and altered in shape, and, projecting into the lumen of the vessels, give rise to more or less obstruction. Numerous fibroblasts may be seen scattered through the tissues.

Cholesteatoma of the Vulva.—Taylor²⁴⁵_{Oct} reports an unique case. The patient was an Irish woman aged 47, strong and healthy, and the mother of one child. She had never suffered from any venereal disease. “Hanging from the upper part of the left nymphæ and præputium clitoridis was a tumor of about the size of a small sickle-pear, suspended by a pedicle about 2 inches in length. The tumor was pinkish white in color, and resembled the scrotum of a young boy. It was softer than a fatty tumor, and rather more firm than a hydrocele.” The growth was of eight years’ duration and painless. Incision permitted the escape of an odorless liquid, thick as tar, and of a dark, greenish-yellow color, which examination proved to be cholesterol. The walls of the tumor were as thick as those of a scrotum.

Elephantiasis of the Labia.—Gutierrez¹⁴⁸_{July} reports a case of a tumor of the nature of an elephantiasic growth, springing from the pubis and the right labium and extending almost to the knees. It was covered with a hard, thick, rugous, and scaly skin, dotted with warty nodules and blackish crusts. The growth was of six years’ duration, considerably increasing in size during gestation and the menstrual periods. It was removed by two elliptical incisions, and found to consist of a myxomatous substance, filled with cavities and cysts containing a yellowish fluid. No examination was made for the *filaria sanguinis hominis*.

Fibromata of the Labia Minora.—Collyer³⁴⁷_{Dec., '99} reports a case of fibroma diffusum of the left labium minus, occurring in a syphilitic subject. It was pinkish white in color, and of a dense consistency; its growth was slow and painless.

Hæmatocoele of the Vulva.—Four cases of blood-tumor of the vulva are reported by H. Tencate Høedemaker¹³_{June 15} and 2 by Ligtnerink. Two classes of this growth are recognized: those that are dependent upon a varicose condition of the vessels, or upon an effusion of blood, and those that have a more or less dense, fibrous contexture.¹²⁹_{Apr.} Operations upon the former are apt to be followed by phlebitis; the latter should be removed either by linear écrasement or by excision. With Moussard,²⁷⁶_{May 5} we look upon

sudden rupture as the gravest accident to be apprehended in varices of the vulva. This may be attended with frightful hæmorrhage and collapse. Subsequent to the rupture, thrombosis and embolism may result, with serious consequence (Hare⁹_{May 24}). When occurring after labor, hæmatomata should be treated with absolute rest, sublimate douches, ice-bladders in the vagina as well as on the perineum, and ergotin and morphia subcutaneously. If gangrene occur incision will be necessary.

Molluscum of the Labia.—Doyen⁵⁷⁷_{July} reported a case of fibroma molluscum of the labium majus developed near the clitoris, non-pedunculated, and surrounded by enormous varices, which rendered the exact diagnosis difficult.

Papilloma of the Vulva.—Papillary vegetations of the vulva are accurately described by Taylor¹_{Jan. 4}: "They may occur singly or in various numbers and are prone to develop in the vulvar sulcus, chiefly around the urethral and vaginal orifices. They are commonly seen on all portions of the vulvo-anal region, and show no tendency whatever to localization to the vulvar ellipse. They are of a pinkish or deep-red color, spear-shaped, digitate, sessile, pedunculated, cauliflower-like, or they may resemble strawberries of various sizes. They are essentially papillary hypertrophies, and show a tendency to exuberant growth." These simple new growths of the vulva have been variously named polypi of the urethra and of the vagina, hypertrophied caruncles, berry-like tumors, villous growths, warty excrescences, and papillary polypoid angioma. Martin²⁶_{Jan. 1} reports a case where they had attained the average length of 3 inches, were very vascular, and bathed in a very fetid discharge.

Sarcoma of the Labia.—This is a rare condition, and one of extraordinary interest. The President of the New York Obstetrical Society presented at one of its meetings a sarcomatous growth of the right labium, the size of an ordinary orange. It involved both labia and was freely movable. The outer surface was solid to the touch, but it was evidently cystic within. The woman's health had not deteriorated, and she felt only a slight inconvenience from the growth while walking.³⁴⁷_{Mar.} This absence of symptoms in the early stage is characteristic of sarcomatous growths wherever located, and might be itself classed as one of the symptoms of the disease.

Lupus of the Vulva.—Häberlin⁹⁵_{Sept. 1} reports an interesting

case of hypertrophic and perforating lupus of the vulva occurring in a tailoress 27 years of age, who had some years previously been treated for gonorrhœa and soft chancre. The lupoid growth involved the entire vulva, the labia majora and minora being extremely hypertrophied and hardened, while at the posterior commissure two perforations were found extending through the hypertrophied tissues. The treatment of such a condition he claims should be radical; extirpation should be practiced, if practicable. A new growth of the vulva is described by Taylor.^{5 Feb.} The growth invaded the vulva in its entirety, so that its normal appearance was entirely lost. No traces of the labia, large or small, existed. The perineum was invaded, as were also the pubes and groins and the skin of the thighs. In no place was there evidence of tumor-like formation, the new growth everywhere being developed *en surface*; in other words, it was flat in structure. The surface of the neoplasm was of a maroon or chocolate color, and was quite glossy. A thin, scanty, reddish serum occasionally bathed the ulcerated surface. The parts presented a firm but decidedly elastic feeling, as if the new growth possessed a fair amount of density. Islets of cicatricial tissue were present at various points around the older portions of the growth. The neoplasm began as a thickened, slightly-elevated patch, of a deep-red color, upon the left labia, small and large, extending from their centre upward and downward until it had invaded the whole vulva, involving both skin and mucous membrane. Microscopical examination of sections of the growth taken during life revealed an increase in the thickness of the Malpighian layer of the derm, the presence of a large amount of granulation tissue, with free blood-corpuscles, and an abundance of small, round, polyhedral cells in the lymph-channels. There were no bacteria to be seen. The distress and weakness of the patient advanced progressively, and she was compelled to take to her bed, and a few months later died of marasmus. No autopsy was made.

Kraurosis Vulvæ.—This comparatively rare disease has attracted considerable attention during the year. According to Oliver^{6 Apr. 19} its usual period of development is about the time of the cessation of the functional activity of the female organ of generation, although Tait, in his recent work, reports 1 case in a girl of 17 years, and Orthmann^{383 No. 19} makes mention of 3 cases observed

in A. Martin's hospital, whose ages were 24, 26, and 32 years, respectively. Briesky, in 1885, made a report of 12 cases, 4 of whom were under the age of 30 years, while Janovsky²⁸_{No. 19} mentions 6 patients under 30 years of age. Ohmann-Dumesnil¹²_{Mar.} also has met with 3 cases under the above age. It would appear, therefore, that, while the majority of the cases of kraurosis vulvæ occur at or about the climacteric, a goodly proportion occur at a much earlier age, and generally in prostitutes or women of loose character. The pathology of the condition consists in an increase of the fibrous tissue of the corium, which more or less completely obliterates the vessels of the fibro-vascular layer, and also impinges upon the nerve-filaments of the mucous membrane. The disease may be general over the vulva or may occur in patches. Intense pallor of the mucous membrane with exquisitely sensitive areas of a brick-red or purplish color, which tend to spread in a serpiginous manner, induration, and dryness of the tissues, with finally an atrophy of the nymphæ and narrowing of the vaginal orifice, are the characteristics of the disease. Oliver and Smith¹⁷⁰_{Oct.} failed to find any trace of sugar in the urine. As regards treatment, palliative measures invariably fail. Operative procedures for the excision of the diseased tissue, removing from both sides of the rima strips of epidermis, including the clitoris, give absolute and permanent relief.

Ohmann-Dumesnil has prepared a tabulated report of the cases he has been able to collect from the literature of the subject. (See next page). To this table has been added 6 other cases.

Tuberculosis of the Vulva.—Primary tuberculosis of the vulva is extremely rare, the most reliable case on record being that of Deschamps. Taylor¹_{Jan. 4} mentions 3 cases in which the ulcers began just beyond the external genital regions and involved the vulva in their extensions. They had finely and coarsely granular papillomatous, and even fungating surfaces, were encircled by hard, somewhat everted edges, and secreted an abundance of pus. In their initial stage they were round or oval tubercles of a deep-, even violaceous-red color, which soon broke down into ulceration. In 1 case was associated a pulmonary phthisis.

Syphilis of the Vulva.—Cases of chancroid of the vulva have been reported by Stumpf³⁴_{Oct. 7} in a woman 60 years of age, and by Taylor¹_{Jan. 4}. Neumann⁸_{May 15} reports an interesting case of

REPORTED CASES OF KRAUTROSIS VULVÆ.

No.	AGE.	SOCIAL CONDITION.	PARTS AFFECTED.	PRURITUS.	PLAQUES.	SYPH.	GON.	LEUC.	NUMBER OF CHILDREN.	NUMBER OF ABOR- TIONS.	REPORTER.
1	61	Single.	Labia majora (?).	Marked.	Yes.	No.	No.	No.	None.	None.	R. F. Weir, N. Y. Med. Jour., March, 1870.
2	25	Married.	Mons. lab. min.	None.	None.	No.	No.	No.	Pregnant.	One.	
3	25	Married.	Labia min. & cl. c.	None.	Yes.	No.	No.	Yes.	One.	One.	
4	30	Married.	.....	Distressing.	Yes.	No.	No.	Yes.	Sterile.	One.
5	22	Married.	.....	Yes.	Yes.	No.	No.	No.	None.	One.
6	
7	
8	
9	
10	
11	Four are mentioned as being affected with pruritus.	Not mentioned.	Not mentioned.	Not mentioned.	Four cases are mentioned.	Five had from one to ten children. Five were pregnant.	One had had an abortion.	Briesky, Zeitschrift f. Heil- kunde, 1885, h.
12	
13	
14	
15	
16	
17	
18	
19	
20	
21	Janovsky, Monatshefte für Prakt. Dermat. 1888, '89.
22	
23	
24	
25	
26	
27	
28	
29	
30	
31	C. Heitzmann, unpublished. Paul F. Mundé and C. Heitzmann. J. N. Hyde, unpublished. A. C. Bernays, unpublished.
32	
33	
34	
35	
36	
37	
38	
39	
40	
41	G. D. Orthmann, Zeitsch. f. Geburts. u. Gynäk., xix, h. C. N. Smith, Buf. Med. and Surg. Jour., Oct., 1880.
42	
43	
44	
45	
46	
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NOTE.—Case No. 29 in the table was one of Dr. Briesky's cases which was referred to Dr. Paul F. Mundé, of New York. The latter had Dr. Heitzmann see it, and he eventually treated her.

multiple genital, peri-genital, and extra-genital sclerosis of syphilitic origin in a young woman 26 years old. The initial treatment¹²⁹_{Feb.} should always consist in the use of mercurials in the form of iodides, which are the preparations best suited for absorption. Granules of the biniodide or of the protiodide, 5 or 6 daily, the former containing 1 milligramme ($\frac{1}{64}$ grain) and the latter 1 centigramme ($\frac{1}{6}$ grain), will generally suffice. They should be aided by Seidlitz salts in the morning, and tonic doses of chalybeates.

Hospital Gangrene of the Vulva.—Herff⁶⁹_{Oct.23} reports a unique case of hospital gangrene originating in an ulcer upon the outer portion of the right labium majus. The edges of the ulcer were undermined and greatly inflamed, and the surrounding tissues for some distance strongly infiltrated. The base of the ulcer was covered with an ashen-gray mass, which secreted a profuse, sero-sanguinolent fluid of a characteristic gangrenous odor. The growth of the ulcer was rapid, and was accompanied by a moderate swelling of the neighboring glands. Under an energetic disinfectant and antiseptic treatment, consisting in lotions of carbolic acid and of salicylic acid and glycerin, the patient rapidly recovered.

Cysts of the Canal of Nuck.—Polaillon¹⁹⁴_{June 12} and Monnier¹⁵²_{Nov.22} have met with cysts in this region. Polaillon's case was peculiar in its location just below the external inguinal ring at the upper portion of the right labium majus, instead of its usual site in the labium itself.

Inflammation of Cowper's Duct and Gland.—Pollacsek³¹⁷_{Nov.22} believes that inflammation of the gland is, as a rule, the result of injury, and is not of gonorrhœal origin, excepting when the duct is involved, or when the duct alone is inflamed. He distinguishes four varieties of "bartholinitis." The *first* is simple catarrh of the duct, in which suppuration may occur, but the inflammation is not specific, and no gonococci are to be found. The *second* is gonorrhœal catarrh of the duct, where the gland is rarely involved, and in exceptional cases but slightly swollen. Suppuration is rare, but this variety, which is very frequent in prostitutes, is very chronic and intractable. The *third* variety is idiopathic suppuration of the gland. It is very acute and may occur in children; the staphylococcus pyogenes aureus is found in the pus. *Lastly*, there is gonorrhœa of the duct with abscess of the gland, due to a mixed infection from the gonococcus and the staphylococcus. The

duct often remains diseased for months or weeks after the opening of the glandular abscess, while the abscess-cavity may be difficult to close, and its duct ultimately become a fistulous tract. Bonnet¹⁹⁴_{Oct.9} favors extirpation of the gland, as do also Polaillon,¹⁹⁴_{June 12} Duchâteau,²²⁰_{July 25} and Davis.⁷⁶⁰_{Jan. 25}

Epithelioma of the Vulvo-Vaginal Gland.—A case is reported by Buckmaster,²⁷_{July} removed from a patient, 45 years of age, who had been sterile. The only trouble experienced was during intercourse.

VAGINA.

Congenital Absence of Vagina.—Cases are reported by Prichard²³⁵_{Dec., '89} and Garde.²⁶⁷_{Sept. 15} Both patients were suffering from retention of the menstrual fluid. Evacuation by puncture of the uterus, the trocar being inserted between that organ and the rectum, was practiced by Prichard, while Garde performed a plastic operation for the formation of a vagina. O'Callaghan¹⁶_{Feb.} advises removal of the tubes and ovaries in such cases. Picqué⁹¹_{Nov. 10, '89} mentions a case of total absence of the vagina, associated with an infantile uterus, in which he created a new vagina by an auto-plastic procedure, which consisted in forming the upper vaginal wall from the mucous membrane of the vestibule and the lower wall from the skin of the perineum. A good result followed.

Atresia Vaginæ.—Krug¹⁵⁰_{Nov., Dec., '89} divides all cases of gynatresia into two groups. In the first he places the atresia with rudimentary uterus and ovaries,—cases which are more or less free from symptoms, and are often discovered accidentally, and which require no treatment; in the second he classes those cases in which accumulation of secretion above the seat of atresia has taken place, the seat being at the orifice of the vagina (hymen), in the vagina (hæmatocolpus), or in the uterine canal itself (hæmatometra). These sooner or later develop symptoms of retention, and require surgical interference. Bársony¹¹³_{Aug. 3} ascribes to congenital atresia three causes: 1. The canal is normally developed, but the walls are compressed. 2. The canal has been destroyed by foetal inflammation. 3. The canal has not extended to the urogenital sinus. As causes for the acquired variety, he mentions wounds of the vagina, corrosive injections, and infectious ulcerations.

Ellis⁵⁹_{Nov. 1} reports the case of a married woman, 17 years of age, who had never menstruated, but who suffered severe pain at

monthly intervals. Examination disclosed the vulva of a girl of 12, with a dense, imperforate, and very elastic hymen. An operation was performed, the hymen being cut through with great difficulty, when there was found an entire absence of the vagina, the space being filled with spongy, areolar tissue. No uterus, sac, or enlarged Fallopian tubes could be made out. Kohl,⁸²_{July 5} mentions a case of an unmarried woman of 35 years, who had suffered with diurnal and nocturnal incontinence of urine for three or four years, which had given rise to painful erosions of the genitalia, perineum, and thighs. Examination revealed a complete atresia vaginæ, which was relieved by operation. A cure of the incontinence followed. Mettenheimer,³⁶⁶_{Nov. 30, '89} has met with a similar case. Annis,¹⁹_{Dec. 14, '89} reports a case of hæmato-metro-colpus, due to cicatricial contraction of the vagina, occurring in a married woman 30 years of age, and the mother of five children. The patient had noticed an enlargement of the uterus about four months after the birth of her last child, which was associated with severe bearing-down pains. Two quarts of chocolate-colored fluid were evacuated and the cicatricial bands divided, the patient making a complete recovery. Prance,⁶_{Dec. 89} has treated 2 cases of transverse septum in the vagina, so complete that an aperture could not be discovered, although menstruation was regularly performed. One of the patients submitted to operation, and the vaginal lumen was restored. Madden,⁶_{Feb. 1} records 3 cases, hitherto unpublished, of congenital absence of the vagina, all being relieved by plastic operations. He emphasizes the necessity for great caution and some special experience in performing operative procedures for the relief of this condition. Cases are on record where the bladder and the peritoneal cavity have been opened with fatal consequences. Prolonged retention of the menstrual fluid may, however, result in rupture of the tubes or uterus, and operation is always indicated in this form of atresia. Krug,¹⁵⁰_{Nov., Dec., '89} in his after-treatment, has abandoned regular irrigation of the vagina and the introduction of the drainage-tubes. Immediately after operating he washes out the cavity with Thiersch's solution, and fills it with a tampon of iodoform gauze. The vulva he covers with corrosive-sublimate gauze. Dubois,⁷⁰_{Feb. 9} calls attention to the influence of the husband in the causation of this disease. With Baas,³¹⁷_{No. 41} he advocates the employment of cocaine in the form of ointments of various strength

(usually 10 per cent.), applied three times a day. Lomer, of Hamburg, ³¹⁷_{Dec. 14} reports 2 cases cured by the mild continuous current of the galvanic cautery.

Vaginitis.—The existence of true blennorrhagic vaginitis, while denied by a large number of writers, is admitted by Welanders in Germany and Horand in France, and by many others. Aubert ²¹¹_{May 11} had 2 cases occurring in young girls of 17 and 18 years of age. There co-existed a blennorrhagic urethritis, but in neither patient was the uterus involved. The reaction of the vaginal secretion was clearly alkaline. Brooks H. Wells ¹⁰¹_{Sept.} reports a case, occurring in a prostitute, in which the entire vaginal walls were red and eroded, and bleeding in spots; and H. Marion Sims ¹⁰¹_{Dec. '89} mentions a pronounced specific vaginitis.

Neumann ⁴⁵_{No. 5, '89} recognizes nine different forms of vaginitis: (1) colpitis acuta diffusa; (2) colpitis acuta granulosa; (3) colpitis chronica diffusa; (4) colpitis chronica granulosa; (5) colpitis agraviditate; (6) colpitis atrophica; (7) colpitis senilis; (8) colpitis aphthosa; (9) colpitis miliaris.

Treatment comprises primarily rigid attention to cleanliness. Burggræve ¹²⁹_{Feb.} recommends "lotions of borax and chloral, which act at the same time as anæsthetics and disinfectants; cauterization of the ulcerations; excision of the excrescences, when present; and, for internal medication, benzoic acid to diminish the irritating properties of the urine, digitaline to restore normal diuresis, hyoscyamine to dissipate spasm, and aconitine to combat vascular erethism," employing the latter only in accordance with the symptoms. Abstinence from exercise and coitus must be enforced. Relief may be derived from the introduction into the vagina of a fine sponge dipped into a solution of chloral and borax and changed from time to time. Sims ¹⁰¹_{Dec. '89} and Wells ¹⁰¹_{Sept.} prefer strong solutions of the nitrate of silver, 1 drachm to the ounce (4 grammes to 32 grammes), coating the vagina with a thin film of silver, somewhat similar to the lining of an egg-shell.

Eloy ³⁵_{July 2} divides acute vaginitis into the initial or primary stage and the terminal stage. During the first he employs hot, soothing injections of liquid vaseline and cocoa-butter, combined with boric acid, 300 grains (20 grammes), to each pint ($\frac{1}{2}$ litre) of the mixture, every few hours. When the stage of acute inflammation has passed, he uses one of the following injections:—

Sulphate of iron or chloral,	. . .	300 grains (20 grammes).
Distilled water,	. . .	1 pint ($\frac{1}{2}$ litre).

Or,

Potassium permanganate,	. . .	2½ grains (0.16 gramme).
Distilled water,	. . .	1 pint ($\frac{1}{2}$ litre).

If the discharge persists after several days, he packs the vagina with cotton tampons saturated with glycerole of tannin, containing equal portions of tannic acid and glycerin, touching the mucous membrane with a strong solution of silver nitrate after the removal of each tampon.

Balzer and Chevalet³¹_{Apr. 24} have treated 40 cases of different degrees of intensity with tampons soaked in retinol. These tampons, they claim, are perfectly well borne, produce no pain, and have proved extremely successful in the cure of this disease, especially where it is accompanied by fungoid vegetations. A mixture of retinol, rosin, and powdered oak-leaves has given a mass which is readily manipulated and of excellent service when applied to the vagina every three or four days. For daily applications a mixture of retinol and rosin with borate of sodium gives better results, although the sodium produces some smarting of the vulva when there are any erosions.

Vulvo-Vaginitis.—Cases of vulvo-vaginitis occurring in children are reported by Huber⁵¹_{Dec., '89} and Ayres.⁵³_{June 14} Huber's case was a frail, anæmic girl of 7 years, who had been troubled for a short time with a vaginal discharge. The hymen was intact, and there were no evidences of violence to be discovered upon the genitals. No examination of the discharge was made for the gonococci. The patient, in the course of a few days, developed an acute general peritonitis. Laparotomy was performed at once, but death occurred twenty hours later. Peritonitis is one of the complications which may attend vulvo-vaginal catarrh occurring in children, Sängér, Hatfield, and Caillé all reporting cases. Ayres reports 2 cases of vulvo-vaginitis complicated by purulent ophthalmia, which were cured without destruction of the sight.

Vaginal Leukoplakia.—Bex publishes some new observations on the disease, which may remain unperceived for a long period of time without occasioning any inconvenience beyond a slight itching, presents itself in the form of whitish plaques upon the vulva, analogous to those which may be observed upon the buccal

mucous membrane. The spots are at first opaline, transparent, permitting the mucous membrane beneath to shine through; but gradually the epidermic layer becomes thickened and opaque and variously tinted. Their surface is slightly rugous, and at points detaches itself in pellicles and scales, or pearly shreds similar to those observed in buccal leukoplakia. The color may be white, pearly, bluish, creamy or cheese-like. The mucous papillæ are hypertrophied. The configuration of the lesions is extremely variable. The plaques are at times hard and very sensitive to the touch, giving rise to a thickening of the vestibule, which may be quite marked. The disease may remain stationary or even disappear under treatment. On the other hand, it may resist all treatment, and even undergo cancerous degeneration. As regards treatment, frequent alkaline injections are recommended, together with the application of ointments, such as starch and oxide of zinc, each 25 grammes ($6\frac{1}{4}$ drachms) to 40 grammes ($1\frac{1}{4}$ ounces) of vaseline. In case of epitheliomatous degeneration surgical interference is indicated.

Varicose Veins and Thrombus of the Vagina.—Benington^{22 Jan. 16} suggests the possibility of accounting for cases of the so-called menstruation during pregnancy by the presence of varicose veins in the vagina. He reports an interesting case of a woman in her second pregnancy who suffered from a sudden attack of hæmorrhage unaccompanied with pain. On examining her he could find no appreciable cause for the bleeding. A month later an examination was made *per vaginam*, when that passage was found to be filled with structures that to the touch resembled soft, movable sausages. An ocular examination revealed varicose veins everywhere, black and tense and as large as the forefinger,—a condition which at once explained the previous hæmorrhage. Chaintre^{211 Jan. 12} reports 3 cases of intra-vaginal thrombus occurring after parturition, all of which were treated with rigorous antisepsis after spontaneous rupture. This included vaginal injections of bichloride and powdering of the vulva with iodoform. To this he ascribes the absence of any complication. Vincent^{211 Nov. 5} advises incision with absolute drainage, followed by iodoform dressing, as the only proper method of treatment for this condition.

Vaginal Syphilis.—Billoir^{122 Oct.} has made an accurate study of the genital syphilides, to which he has added a number of personal

observations, and asserts that the vaginal syphilides have two seats of predilection outside of the vaginal ring: first, in the ampulla of the vagina, which is the customary seat of the secondary lesions, and, secondly, in the middle part of the vagina, where observed more rarely. Neumann⁴⁵_{No. 5, '89} sustains him in this assertion. He says that venereal ulcers (soft chancres) are extremely rare in the vagina, occurring, for the most part, at the vaginal entry, extending from the carunculæ, but are less rare on the cervix uteri and vault of the vagina. The reason of the great rarity of these ulcers on the vaginal wall is, according to Neumann, because it is protected by thick layers of pavement epithelium, while the vault of the vagina and cervix uteri are only covered with a thin layer of epithelium. Neumann has only seen two examples of sores in the middle third of the vagina, while on the cervix uteri they occur frequently, though not so frequently as is commonly supposed. Billoir has divided the vaginal syphilides into the following types: (1) erosive; (2) papulo-erosive; (3) superficial ulcerous; (4) diphtheritic; (5) deep ulcerous. The erosive and papulo-erosive forms are the lesions without gravity; by care, proper hygiene, and correct treatment they rapidly disappear; they may even cure spontaneously. According to Neumann, "*broad condylomata* are more common on the cervix and vaginal roof than are primary sores. They may be single or multiple, and appear as moderately-raised lenticular papules, covered with a yellowish, adherent exudation. *Pointed condylomata* (warts) grow more frequently from the prominences of the rugæ than from the bottom of the folds. They originate almost always in a large increase of the papillæ, and, from grains the size of a millet-seed, may become by degrees prominences resembling the comb of a cock. Warts are never found in old age, because of the senile shrinkage of the papillary layer which then takes place. *Gummy affections* of the vagina occur most frequently in the lower third and about the vaginal orifice, never alone, but mostly in connection with gummata of the vestibule, labia majora, posterior commissure, or rectum. Vaginal gummata originate in the submucous connective tissue, and when they break down externally give rise to ulcers with undermined edges, thus differing from the ulcers produced by cutaneous gummata, which usually have a contour of a simple or ordinary kind.

The treatment of vaginal syphilis is local and general: the general treatment is that of syphilis elsewhere; the local treatment consists in vaginal washes of bichloride, cauterization by silver nitrate, and applications of resorcinized or iodoformized glycerin tampons.

Tuberculosis of the Vagina.—Haidenthaller^{8 Aug 21} describes a case of tuberculous ulceration of the portio vaginalis, which possessed more than usual interest, since in all other cases that have been reported the tubercles were of the miliary variety. The patient was 29 years of age, and had given birth to three children, one of whom had died of tuberculosis of the intestines. Her father died of phthisis, and she had had a catarrh for several years. Three years and a half before coming under observation she had aborted at the second month, and suffered from metrorrhagia for eight months after, when the hæmorrhage was arrested by curetting. Two months later she began to have a sanguineous discharge, which later became purulent and foul-smelling. She emaciated rapidly, and complained of pains in the abdomen, with cramps in the lower limbs. On examination well-marked evidences of pulmonary trouble were found; the abdomen was tympanitic and so tender that thorough palpation was impossible. The urine, as well as the sputum, contained tubercle bacilli. Vaginal examination showed that the uterus was small, retroflexed, and adherent, while the left tube was enlarged to the size of the little finger. On the anterior lip of the cervix there was a superficial ulcer as large as a quarter of a dollar. A diagnosis was made of tuberculosis of the lungs, tube, corpus and cervix uteri, with probable tuberculous disease of the intestines. At the autopsy this was entirely confirmed; the entire endometrium was studded with cheesy nodules, as well as the kidneys, ureters, and bladder. It is probable that the primary infection in the genital tract was situated in the tube, and that the lacerated and eroded cervix became infected through the discharge from the interior of the uterus, which began after the abortion. There was a possibility that infection had been introduced by the curette.

Defay^{832 V.3,p.1} also reports a case of tuberculous ulceration of the vagina. The therapeutics of the affection, according to Daurios,^{148 Mar.25} embrace, for the smaller ulcerations, repeated applications of tincture of iodine, iodoform, and chromic acid. This will not suffice for

deeper ulcerations, which require the intervention of the surgeon. If they are located on the cervix, amputation of that portion of the uterus or ablation of the entire organ may be necessitated. To the local a general treatment must be added.

Tumors of the Vagina.—Vaginal tumors are of extremely rare occurrence. Frick³³⁶_{Sept.29} mentions 2 cases of primary sarcoma occurring in very young children in Volkmann's clinic. The first case was in an infant aged 7 months; death resulted three months after extirpation. The second case was in a child aged 2½ years, who recovered, and is now, almost three years after the operation, in good health. A case of fibro-myoma of the vagina is reported,¹_{Apr.12} which was attached by a pedicle to the posterior vaginal wall just within the introitus vaginæ. It was transfixed and removed. Microscopical examination revealed that its structural components resembled those of the uterus; utricular glands were also found in it. Two cases of vascular tumor of the vagina are reported, 1 by Duchaussoy,⁸²⁴_{Sept.30} in a girl of 3 years, situated upon the posterior wall of the vagina just back of the hymen; and the other, by Burggraave,¹²⁹_{Apr.} in a woman. In this patient the tumor was pediculated and implanted upon the superior wall of the vagina, back of the clitoris. Both tumors were excised.

Although primary cancer of the vagina is an excessively rare affection, a number of cases have been reported during the year. Parvin⁶¹_{Jan.4} has met with a case in a woman, 46 years of age, in whom two-thirds of the posterior wall was destroyed. There was no disease of either the cervix or the vulva. Blagovestschensky⁵⁵_{Mar.1} treated a patient who was but 33 years of age. The growth was situated upon the posterior vaginal wall and in the posterior *cul-de-sac*. Dennetières²²⁰_{Mar.21} had a case in a woman 43 years old, the cancerous growth involving the posterior wall, extending almost to the cervix, which, however, was healthy, as was also the posterior *cul-de-sac*; while Pchelne⁵⁸⁶_{No.22} describes a patient who was under his personal observation, 69 years of age, with a cancerous growth of the anterior wall of the vagina, and 2 patients of Wino-gradoff, the seat of the growth not being given. The remedial measures should consist in immediate removal by the knife if the disease has not progressed too far.

Cysts of the Vagina.—Baldy²³_{Dec.,89} reported a case, and concludes that this condition arises from a retention of the vaginal secretion

in the glands of the vagina. He much prefers enucleation to incision. Mangiagalli ¹⁴⁸_{June 25} mentions a case of vaginal cyst containing gas, encountered during the second gestation of a young woman 25 years of age. He agrees with Klauser and Welponer that the contents of these cysts are composed of a mixture of oxygen and azote, the origin of which is probably the atmospheric air. The principal seat is in the superior vaginal wall, upon the posterior portion. Most frequently they are superficial, projecting, and sessile, almost exclusively encountered during gestation, and their number rarely exceeds two.

Foreign Bodies in the Vagina.—Cases are on record by Pierre, ²⁰³_{Apr. 1, '99} Grandin, ³⁴⁷_{Dec. '89} Tolmatcheff, ⁶³⁶_{No. 1} Pamard, ⁹¹_{May} Bax, ²³⁰_{June, '89} and R. S. ¹³⁰_{Sept.} The latter case is of special interest. A girl 20 years of age had, twenty days prior to the time she came under observation, a menorrhagia dating from the close of the regular menstrual period and in the form of a profuse flooding immediately after, since which there had been a varying hæmorrhage. The patient did not complain of pain, tympanites, or symptoms other than the great exsanguination consequent upon the profuse flow. A slight fullness of the left border of the virgin os uteri was the only structural change detected by examination. Twelve hours later the patient died. The autopsy revealed a pint of blood in the posterior *cul-de-sac*. Inclosed in the lower border of the broad ligament near its edge, and piercing the cervix uteri just above the vaginal portion, was a medium-sized, well-incrusted toilet-pin, having the usual round, somewhat large head of this article. No cause is assigned for its presence in that position. In Bax's patient, a little girl of 5 years, the foreign body was a hair-pin which had become imbedded in the tissues on either side of the vulva, the point of the pin on the left side having given rise to an ulcer which had resisted all treatment. Pamard's case is of interest from the fact that the foreign body, a pencil 5 inches in length, and incrusted for $2\frac{1}{2}$ inches with a large phosphatic calculus, had given rise to an incontinence of urine with marked cachexia. The vesico-vaginal septum had been completely destroyed. The calculus lay in the bladder, and the point of the pencil had perforated the upper aspect of that organ. After the extraction of the pencil a greenish fluid escaped, proving the existence of a vesico-intestinal fistula. Pamard endeavored to close the great breach in the ante-

rior vaginal wall by dissecting up a flap from the vulva and uniting it to the edges of the fistula. Two days after the operation the patient was seized with influenza, and died of pulmonary complications. At the necropsy it was found that the pencil had perforated the bladder, a loop of small intestine, and the cæcum.

Injuries of the Vagina.—T. C. Smith²⁷ reports a case of almost fatal hæmorrhage following perforation of the vaginal fornix, about 1 inch behind the cervix uteri, by the nozzle of a syringe which had been forcibly introduced. The hæmorrhage did not occur until about eight hours after the occurrence of the injury. Frank⁸¹_{Dec.14,'89} has met with 2 cases of laceration of the vagina following coitus, while Eklund¹⁵⁴_{Mar.1} describes a case of rupture of the posterior *cul-de-sac* from the same cause. A destruction of the vesico-vaginal wall from the long-continued pressure of a pessary is reported.²¹⁴_{Jan.1} A rare condition and one of extreme interest is described by Oliver.²_{Mar.} A single and nulliparous woman, while lifting a heavy box with both hands, was seized with intense bearing-down pains; locomotion increased the discomfort, and it was impossible for her to sit down except on the edge of a seat, and even this was painful. The vagina was completely extroverted; the cervix uteri was directed forward, and the fundus, which was extruded beyond the external genitals, was readily directed posteriorly toward the anus. The mucous membrane of the cervical canal was everted to the extent of $\frac{1}{2}$ inch, and a sanious discharge was exuding from the everted mucous membrane. It was replaced with great difficulty.

Cystocele and Rectocele—Colporrhaphy.—Cystopexy, the comparatively recent operation for the relief of cystocele, continues to excite considerable interest. Various methods of performing this operation have been suggested, including those of Wlaccaz, of Metelin, Dumoret, and Tuffier, of Paris, and Byford, of Chicago. Properly speaking, the methods of Wlaccaz, Dumoret, and Tuffier are true cystopexias, while that of Byford merits rather the name which he has suggested for it, namely, colpocystorrhaphy, or the inguinal suspension of the bladder. The method of Wlaccaz and Dumoret¹⁴⁸_{July} consists in a fixation of the bladder by passing the thread into its wall, which is still covered by the peritoneum, an intra-peritoneal cystopexy thus being performed. They proceed as follows: The bladder being distended by a disinfectant injection,

an incision is made in the median line of the hypogastrium from 4 to 6 centimetres in length, and the bladder exposed. A catgut suture, No. 4, is then carried through the left lip of the abdominal incision, the skin excepted, traversing the superficial layers of the bladder, including the peritoneum, and emerging through the right lip of the abdominal wound without including the skin. The ends being drawn together, the bladder is elevated. The abdominal incision is then closed and an antiseptic dressing applied.

Tuffier, ⁷⁰_{Sept. 21} not caring to include the serous membrane in his stitch, passes the thread through the lateral walls of the bladder below the peritoneal fold. The steps of the operation follow: Incising the abdominal wall, layer by layer, in the median line, the bladder is reached. Freeing this from the peritoneum and retro-pubic cellular tissue, it is seized and drawn through the lips of the wound, this manœuvre being facilitated by an assistant, who pushes up the bladder by his finger introduced into the vagina. Each lateral wall of the organ is then traversed by five catgut sutures, which are continued through the muscles of the abdominal wall at some distance from the lips of the wound. On drawing upon these threads the lateral walls of the bladder are raised and brought to the symphysis, while its anterior face is gathered in the median line. The abdominal wound is closed with catgut and the skin sutured with Florence horse-hair.

Byford, ²⁷_{Feb.} disliking to interfere with the bladder, cuts down through the inguinal canals, and thence through the posterior walls of the latter into the para-vesicle (post-pubic) cellular tissue, and stitches this tissue and the entire thickness of the vaginal wall at either side of the urethra to the incision in the walls of the canal. This operation may be readily supplemented by Alexander's operation without much additional time or traumatism.

While cystopexy has commanded much attention on both sides of the water, other operations for the cure of cystocele have been suggested. Mundé ²⁷_{Mar.} recommends the adoption of Stoltz's method. The special advantages he claims for his operation are that the relaxed and redundant anterior vaginal wall is contracted in such a manner that all the pressure is exerted on a circular cicatrix, which is much less likely to yield and allow a return of the prolapse than is a longitudinal scar; and, in addition, there is no interference with any operation upon the cervix, perineum,

or posterior vaginal wall, all of which may be performed at the same sitting. The method consists in a circular denudation of the protruding anterior vaginal wall, the size of the denudation varying with the degree of the cystocele. A stout silk ligature is passed entirely around the wound slightly outside of the line of denudation, the two ends crossing below the meatus urinarius. The ligature is then firmly tied, the centre of the denuded surface being pressed into the bladder with a sound. But little pain follows this operation. Rossier⁹⁵_{H.3} favors the duplex anterior colporrhaphy. This consists of the denudation of two elliptical surfaces upon either side of the cystocele, the edges then being united by sutures placed transversely. Currier⁶¹_{July 19} suggests an operation for contracting the vaginal wall to a sufficient extent both in length and breadth, instead of in length only, thus distributing the tension over two lines of union at right angles to each other. His procedure consists in removing an elliptical strip of mucous membrane of sufficiently large area, as in the Dieffenbach and other operations, and then another elliptical strip at right angles to the first, the major axes of the two ellipses intersecting at their middle point. No. 2 or No. 3 catgut is used in closing the wound, according to the thickness of the mucous membrane. Deep continuous sutures are made, if the connective tissue is thick enough to warrant it; otherwise the sutures are carried directly from edge to edge of the wound. "The portion of the wound nearest the cervix is first closed, the suturing being continued as far as the junction of the longitudinal with the transverse ellipse. Then, with another needle and suture, the portion of the wound nearest the meatus urinarius is closed, the suturing being continued as far as the junction of that portion of the longitudinal with the transverse ellipse. Then, in precisely the same manner as before, the transverse segments of the wound are closed and the two sutures are finally tied together at the middle point of the entire wound. The result is that the vagina is narrowed and also shortened to the desired extent, and the tension is evenly distributed over two lines of union, which cut each other at right angles in the middle point."

DISEASES OF PREGNANCY.

By WALTER P. MANTON, M.D.,

DETROIT.

STERILITY.

IN his very admirable address before the American Gynæcological Society, Reynolds²⁷_{Oct.} stated that marriage implied child-bearing, and that divorce had in the restriction of child-bearing its most effective cause. The very frequent occurrence of sterility among women has led Oliver¹⁸⁷_{Jan.} to investigate the subject, and his study enables him to roughly estimate the number of unproductive females as one in fifteen (1 : 15). The causes for this condition are enumerated by Lutaud¹⁰⁴⁵ in his recent work as follows: 1. Sterility due to incomplete copulation (vaginismus, imperforate hymen, etc.). 2. Sterility due to mechanical obstruction, preventing the spermatozoa from entering the uterus (atresia of the cervix, anomalies of conformation, displacements of the uterus). 3. Sterility due to the destruction of the germ in the uterus (endometritis and morbid conditions of the uterus in general). 4. Sterility due to incomplete ovulation and incubation (diseases of the ovaries). 5. Sterility due to constitutional diatheses (syphilis, alcoholism, morphinomania). The second cause is well illustrated in an article by Valenta,⁵⁷_{Jan. 5} who points out that a shortening of the anterior vaginal wall, which is usually associated with uterine deviation, is a not infrequent cause of sterility. This condition he found to exist in 129 (or 13 per cent.) out of 1000 cases examined. Where this is present there is also usually a low position of the uterus, the os externum being directed upward toward the pubes, so that during coitus the male organ passes behind the uterine neck, and the semen is deposited in the posterior vaginal fornix. As was pointed out by Sims, this anatomical effect causes a bulging of the vaginal fornix by the male organ, and as soon as the latter is withdrawn a contraction of the parts takes place, thus forcing the spermatie fluid out of the canal,—a condition noted and complained of by

Valenta's patients. It must not be lost sight of, however, that the female is not always responsible for the unproductive condition; for Lier and Ascher³⁹³_{v.18,p.262} have found that in 227 cases of sterility the fault could be credited to the husband in 132 instances, and that where the latter was responsible recovery of power took place in only 6 per cent., while of the women 25 per cent. subsequently became pregnant. Levy⁸⁴⁴_{No.32} classes these cases of male sterility under two heads: (1) those in which coitus is possible, but there is no sperm (aspermatisim), or the sperm contains no spermatozoa (azoospermia); (2) and those where coitus is impossible (impotence) from local or central causes. Casper⁶⁹_{No.16} notes a case of the first class in which the wife, after two years of marriage, had not conceived. The husband was found to be azoospermatic, due to a relapse from *lues*. Antisyphilitic treatment, pursued for a few months, resulted in a cure, and the hitherto barren wife immediately became pregnant.

Coe¹³⁷_{Mar.} also cites a case in which the spermatic fluid was devoid of spermatozoa, and the husband admitted having had double epididymitis.

Treatment.—Where anatomical defects exist, Valenta⁵⁷_{Jan.6} advises infrequent connection, so that the female organs may have time to rest; then coitus in the knee-elbow or other position, with partial withdrawal of the penis before ejaculation in order that the semen may be deposited in the anterior portion of the vagina. Following the act the woman should lie quietly for some time, with the thighs pressed close together. Hanson, in a private communication, states that he has had excellent results following the administration of such drugs as *helionias dioica*, *pil. damiana et phos. cum nux vom.*, *lilium tigrinum* (tiger-lily), *cimicifuga racemosa*, *caulophyllum*, and the salts of barium. The influence of drugs in overcoming sterility must, however, be looked upon as exceedingly doubtful. The advocates of the various well-known surgical operations for the relief of this condition have published numerous cases in which success has followed. But, in spite of all therapeutic measures, a certain percentage of women still remain barren; for, as Coe¹³⁷_{Mar.} says, we are not yet acquainted with the more occult causes of sterility, and hence are unable to reach all cases with our treatment.

FERTILITY.

That some women conceive in spite of all obstacles is well demonstrated by a case of Heyder's.⁹⁵ The patient was in the seventh month of pregnancy. Stretched somewhat obliquely across the vagina, about 4 centimetres above the ruptured hymen, there was found a presumably congenital membrane, the only opening in which was a small aperture, 2 millimetres in diameter, close up under the pubes. Grigg²_{Mar.3} narrates the history of a woman whose great-grandmother had three sets of triplets; the grandmother bore triplets once, twins twice; the mother, triplets once, twins twice, and had five single births; the patient herself had had triplets twice and ten single births; while her eldest daughter had triplets once and a single birth.

Fox⁶_{July 25} reports a case of triplets. The mother suffered during and after labor from eclampsia, the urine being loaded with albumen. There was one placenta and three cords. All three children succumbed at 1, 3, and 7 months of age. The mother made a good recovery.

Servaes²_{Mar.15} delivered a woman in the sixth month of pregnancy of twins, along with a fleshy mole. There were two placentaë joined at one edge with marginal (battledoor) insertion of the cords.

In a case of induced abortion for hæmorrhage, Pater⁵⁹_{July 19} delivered twins, one of which was developed to the size at the fifth month, with normal attachment of the placenta, the other being but 1 inch long, mummified, and having a partially-developed placenta prævia lateralis. Speck¹_{Jan.18} records a case of triplets aborted at the eighth week of pregnancy. The expulsion of the fœtuses occurred with an interval of two days between each. The second and third fœtuses were decomposed, as was the placenta, which had to be removed piecemeal by the finger. The placenta was as large and thick as it normally is at term.

Habit¹¹³_{Oct.5} saw a case of abortion of twins in which there was an interval of seven days between the expulsion of the first fœtus and the birth of the second. There were two placentaë and two sets of membranes.

SIGNS OF PREGNANCY.

Segur²⁷_{May} states that there are three classes of women with which the physician has to deal: (1) those women who have no intention

to deceive, but in whom the condition of pregnancy is doubtful; (2) those who desire to become pregnant; and (3) those who fear that they are pregnant, but do not wish to bear children. More Madden⁵_{July} remarks that the possibility of pseudocyesis should never be lost sight of in accepting an obstetric engagement. A case in point is reported by Cortella.⁵⁰⁵_{May 28} The patient was a young hysterical woman, who, soon after marriage, developed all the symptoms of pregnancy. After a few months' absence the menses re-appeared for two months. The abdomen enlarged, and a midwife declared that she could detect the movements of a child at about the fifth month of gestation and hear the foetal heart. The patient also declared that she felt motion. Labor failing to take place at the expected time, Cortella was sent for, and on examination found a virginal cervix with closed os. The abdomen was uniformly distended and tympanitic; the breasts presented a darkened areola, but the papillæ were not prominent. Following the examination all the symptoms of pregnancy disappeared.

The difficulties which surround a positive diagnosis of pregnancy were well illustrated by Cleveland²⁷_{Mar. 15} in his remarks before the Cincinnati Obstetrical Society. He was called in consultation to a woman 35 years of age, who was emaciated and anæmic to the last degree. Incoercible vomiting was present, and was attributed to gastric ulcer or catarrh. Menstruation had been absent two months. The patient's appearance suggested malignant disease or the last stage of consumption, yet there had been no cough or vomiting of blood, nor was there any tumor in the abdomen. All food caused pain, nausea, and vomiting. Uterine examination revealed little; the organ was only slightly enlarged. The patient seemed *in extremis*, but under careful diet—koumis, Fowler's solution, and ingluvin—she finally regained her strength, and in due time was delivered of a child.

That suppression of menstruation is not always coincident with pregnancy has been proved by Oliver,⁶_{Mar. 15} who reports a case in which menstruation apparently occurred twice after conception. Aust-Lawrence²_{May 10} holds that one period may occur after impregnation has taken place, but that all repeated discharges of blood from the uterus are due to cervical granulations, erosions, cancer, or the like.

Rothwell⁸⁹_{Aug} also says that where endometritis has existed pre-

vious to pregnancy slight hæmorrhage is liable to occur from pressure of the enlarging fœtus on the congested veins of the endometrium.

A method of diagnosing early pregnancy is advocated by Benson.¹⁹⁶_{Dec., '89} This consists in the careful passing of the uterine sound and the touch. Taking the physiological condition of the uterus up to the tenth or eleventh week into consideration, he thinks that the sound may be passed without causing any impressionable disturbance to fœtal development. In pregnancy the uterus will be found to be elongated and markedly dilated at the internal os. This method is certainly too fraught with danger to be generally adopted by the profession.

Budd⁸¹_{Mar.} again calls attention to the method of diagnosing early pregnancy by the triple-phosphates in the urine, which was first described by Gray.⁸¹_{Mar., '77} This sign consists in the appearance of the triple-phosphate crystals after precipitating by Tyson's magnesium fluid. In the urine from non-pregnant women the crystals are fine and feathery in appearance, but as soon as pregnancy has taken place they lose this form and begin to disintegrate. The change commences at the tip of the crystal and progresses toward its base; or only one side of the leaflet may be affected, leaving the other intact. As disintegration progresses only the bare stem may be left, with, perhaps, a few scraggy points jutting out from its sides, or even these stems may be broken into bits, with scarcely any mark to identify them as triple phosphates. After the middle of the seventh month of pregnancy the change becomes less pronounced, and should the fœtus perish at any time the crystals at once become normal.

ABORTION.

Etiology.—Miller²¹³_{Dec., '89} cites instances where repeated miscarriages were due to nervous excitement,—twice as the result of unpleasant dreams and twice to social influences.

Purslow⁶_{Jan., '26} exhibited before the Midland Medical Society an ovum aborted at the end of the fifth week, the result of mental excitement caused by a quarrel.

Haberlin³¹⁷_{No. 26} saw pregnancy interrupted at eight months by death of the fœtus from premature separation of the placenta due to exophthalmic goitre. The puerperium was normal and the

symptoms of goitre subsided. In a case reported by Moore⁸²_{Aug. 15} the administration of 2-grain (0.13 gramme) doses of binocide of manganese, three times a day, was followed by abortion and septic infection. Upshur¹_{Nov. 22} cites a case in which the patient aborted twice, presumably the result of a latent endometritis. Gumsolus³³⁹_{June} saw an abortion from retroplacental hæmorrhage (placental apoplexy).

Criminal Abortion.—Johnson¹⁰¹_{May 10} says: "There is no longer any doubt, from a consideration of all the evidences before relied upon to prove its frequency, that abortion is now fully as frequent as it ever was in this country, and, moreover, is alarmingly on the increase; not only is this believed to be true of the cities, but the remotest country districts seem to be infected also." Criminal abortion appears to be very common also in certain parts of England.²²_{Jan. 15} Sudden death from criminal abortion is not at all infrequent. Gilbert⁷⁶⁰_{Nov. 15} communicates the following case to the Medico-Legal Society of Paris: A woman in the fourth month of pregnancy placed herself under the care of an abortionist, who introduced the nozzle of a small rubber syringe into the cervical canal. Immediately after, before any injection had been made, the patient was attacked with syncope, which became more severe, and was followed by death in five minutes. The autopsy revealed no lesion whatever; it is, therefore, probable that the death by syncope was due to a phenomenon of inhibition, already observed in cases of a similar nature. At a meeting of the Minnesota Academy of Medicine, Merrill¹⁰⁵_{Nov. 1} showed the uterus and appendages removed post-mortem from a woman who had died from the consequences of an abortion. The patient, aged 21, was said to have had a catheter introduced into the uterus, for the purpose of procuring an abortion, on September 24, 1890. The contents of the uterus were expelled September 25th, and on September 30th the patient died, seemingly of peritonitis. The autopsy, made under the direction of the coroner, showed a necrotic surface in the interior of the uterus over the site of the placenta; no disease of the tubes, but an abscess involving the ovary and a general peritonitis; pericarditis, with purulent effusion; and old adhesions of the pleura, due to remote disease. There was no evidence of inflammation of either the uterus or the tubes.

Treatment.—In threatened abortion Haskins¹⁸⁶_{Apr.} has used anti-pyrin with success.

Missed Abortion.—Ross reports a case in which the fœtus died at the fourth month, and was retained in the uterus for eight months longer, at which time it was artificially removed. It was well preserved, of a brownish color, and easily torn. There was no evidence of decomposition. Kempf⁴³_{July} delivered a case of twin conception where the fœtuses were presumably retained in the uterus seven months after their death. One fœtus was $3\frac{1}{2}$ inches long, the other 3 inches, and both were covered with grayish spots the size of a pin's head. The two umbilical cords joined about 2 inches from their abdominal insertion and entered the placenta, which resembled cotyledons of tallow, as one cord. Balin³¹⁷_{No.14} relates the case of a woman in whom missed abortion occurred three times. In the last instance, a four-month-developed fœtus was carried for five months longer, and, when expelled, appeared dry and mummified.

Indications for the Induction of Abortion or Premature Labor.—Parvin,²⁷_{Aug.} in his paper before the Tenth International Medical Congress, gives the following indications for the induction of premature labor: 1. Diseases of the kidneys. Rarely an indication, as prophylactic measures will generally suffice. 2. In chronic heart disease the same holds good. 3. Diseases of respiratory organs. Satisfactory results often obtained by premature delivery. 4. Chorea, in cases where the life of the mother is jeopardized and other remedies fail. 5. Eclampsia,—an open question, though this furnishes but rarely an indication. 6. Occasionally, in cancer of the rectum. 7. In severe cases of rheumatism. 8. In mammary cancer. This is also recommended by Kleinwächter.¹³_{July}

In the discussion on this subject before the Congress, in which Calderini, Dohrn, Leopold, Löhlein, Sängner, Fehling, and others⁴¹_{Sept.18} participated, the consensus of opinion seemed to favor induced abortion in all cases where the true conjugate of the pelvis was over 7 centimetres, as the chances for mother and child were more favorable than following Cæsarian section. Dohrn⁸⁴_{Nov.15} states that in 318 cases of induced premature labor, 16, or 5 per cent., of the mothers died. Sängner⁸⁴_{Nov.16} showed, on the other hand, that in over 100 cases of the new Cæsarian section the maternal mortality was but 6 per cent. Ahlfeld³¹⁷_{No.30} reports 118 cases of induced abortion, of which 111 were for contracted pelvis. Of this latter number one mother died,—a mortality of 0.9 per cent. He therefore claims that the induction of premature labor in cases of contracted pelvis

maintains the chief place among the methods of delivery which aim at saving the child, in spite of the greatly-improved results obtained by Cæsarian operation. Ingerslev¹³_{Apr.} considers nephritis, and possibly hæmaturia, as indication for induction of labor. Dirner¹¹³_{July 12} reports a case in which the children of 3 pregnancies had all been born dead. Artificially induced labor during the thirty-sixth week of the fourth pregnancy resulted in the delivery of a healthy living child. Noble¹⁰⁴_{Mar. 9} relates the interesting case of a IV-para, having a flat pelvis with a C. S., 8 centimetres, and a C. V. (estimated), $6\frac{1}{2}$ to 7 centimetres. The first child's head had been injured by forceps, so that it died shortly after birth; the second, a very small infant, was born spontaneously and lived; the third was delivered by the Cæsarian operation, and the fourth after induced labor at the eighth month. This last labor was with difficulty terminated by the use of high forceps. The placenta was situated over the cicatrix of the old Cæsarian section and was adherent.

Hawkins¹⁰⁵_{Sept. 15} had a case of placenta prævia in which it became necessary to induce miscarriage at six and a half months. Stedman⁹⁹_{Dec. 19, '99} brought on labor in a woman in whom sudden œdema of face and swelling of feet occurred. The urine was albuminous and contained casts. Later there was threefold tumefaction of the vulva, and the patient's vision was obscured.

But, as Macan²³_{Oct.} remarks in regard to the induction of premature labor, "no matter how positively we may lay down the indications in any given case, it is the woman herself who has finally the right to determine what unnecessary danger she should run for the sake of her unborn child."

Substitution for Induced Labor.—Von Brehm²¹_{No. 9} publishes the results obtained by the dietary method of Prochownick in a case of contracted pelvis, in which premature delivery was indicated. The pelvic measurements in v. Brehm's case were: spin., 21 centimetres; crest, 23.5 centimetres; trochant., 25.5 centimetres; conj. ext., 16.5 centimetres; conj. dig., 9.8 centimetres.

This method aims to prevent the formation of adipose tissue in the fœtus, and to render it supple, especially with reference to the mobility of the head-bones.³¹⁷_{Aug. 17, '99} The diet prescribed by v. Brehm demanded the withdrawal of fluid as much as possible, and prohibited fat-producing solids. It consisted of, in the morning, a small cup of tea with milk and 30 grammes ($7\frac{1}{2}$ drachms)

of zwieback (a sort of sweet-bread toast); at noon, a small dish of animal broth, with vegetables, grits (flour and butter being omitted), lean meat or fish with a little sauce, green vegetables, and a glass of white port-wine; in the afternoon, small cup of coffee with milk and 30 grammes ($7\frac{1}{2}$ drachms) zwieback; at night, small cup of tea with milk, cheese, cold toast, soft egg, 15 grammes ($3\frac{3}{4}$ drachms) white bread with butter, and a glass of white port-wine. The result was spontaneous birth of a well-nourished but slim girl, with little or no panniculus adiposus. The mother and child did well, and the latter gained rapidly in weight. The treatment was inaugurated during the eighth month of pregnancy. V. Swiecicki ⁶⁵⁰_{v.13, No. 22} also testifies to the value of this method, and reports 4 cases which were so treated with excellent results.

Induction of Abortion or Premature Labor.—Boisard ²⁴_{Jan. 19} discusses the various methods in vogue. Uterine injections he declares unreliable and unsafe; sponge and laminaria tents—the latter are best on account of being aseptic—are slow and often unreliable. Their use should be confined to multiparæ where the os is small and rigid. Puncture of the membranes is infallible, but slow, inconvenient, and dangerous; the bougie is dangerous and not wholly to be relied on; the most satisfactory method is by Tarnier's or Champetier's balloon dilators, of which the latter is the best (ANNUAL, 1889, vol. ii, p. I-8). The drawbacks to their use are the occasional difficulty of adjusting them, the danger of rupturing the membranes, of separating the placenta, of pushing back or altering the position of the child. He reports 18 successful cases treated by this method. Macan ²³_{Oct.} asserts that the introduction of Barnes's bag is the best means of inducing abortion, and that while the method is slow, this is often a desirable feature. Braun-Fernwald ²²_{July 9} prefers puncturing the membranes. His maternal mortality following this procedure is *nil*. Leopold, ²²_{July 9} in speaking of the introduction of the bougie, says that the average time required in bringing on pains is eighty hours, while, after tearing of the membranes, it is forty-nine. Bayer ⁴⁰¹_{No. 326} recommends galvanism. The constant stream produces contraction of the gravid uterus with certainty in the majority of cases,—is sure and absolutely safe. Relaxing, softening, and opening of the cervix follows application. To obtain the best effects the pauses between

the applications of the current should not be longer than between contractions in normal labor. The internal electrode (cathode) is left in the cervical canal, and, from time to time, the anode is placed upon the abdomen. Kleinwächter¹⁰⁴⁶ advocates the injection of lukewarm water between the uterine wall and the membranes.

Treatment of Abortion.—Stratz⁵⁸³_{B.29,H.5,6} divides the treatment of abortion into (a) prophylaxis; (b) treatment of abortion; (c) treatment of after-conditions. Under the first head he includes syphilis, endometritis, renal disease, dyscrasias, traumatism, etc., for which rest in bed, opium, and general treatment serve at times; in the second stage, disinfection and tamponade of the vagina, and also of cervix, when possible. Active measures should be resorted to only when the hæmorrhage is considerable and there is fever. He is opposed to the curette, preferring to remove the ovum with the finger. In only 5 cases out of 486 was it necessary to use the curette. All of these were septic, and in all there was a tetanic condition of the uterus, due to the previous administration of secalè. In the last division the treatment is directed to the remaining endometritis, etc. Kleinwächter¹⁰⁴⁶ uses either curette or the finger, and, when the cervix is relaxed, performs rapid dilatation with either Fritsch's or Hegar's dilators. Long,⁴³_{July} in an interesting communication, advises the use of the curette. One fact must not be lost sight of, however, in the use of this instrument, and that is that with the softened condition of the uterine tissues perforation is, in some cases, an easy accident. Haynes²⁷_{Nov.} reports 2 accidents of this kind. In cases where the ovum is unruptured, and plugging becomes necessary, Macan⁹⁹_{Oct.30} recommends the use of a tupelo tent, inserted into the cervix. In such cases Robertson⁶_{Apr.5} has successfully employed the Gariel air-ball pessary. This acts in the same manner as a Brann's colpeurynter, checking hæmorrhage and promoting uterine contractions. In the treatment of hæmorrhage following abortion, Trowbridge¹⁰⁵_{May} has had gratifying results from the hypodermatic administration of $\frac{1}{60}$ grain (0.0016 gramme) of atropine.

Abortion and Pregnancy.—Winter⁴¹_{Oct.13} has made some interesting investigations in order to ascertain the effect of the mechanical treatment of abortion or subsequent conception. From a careful analysis of 100 cases he finds that pregnancy occurred

subsequent to abortion in 38 per cent. of cases where there was total or partial retention of the decidua vera, against 6.29 per cent. where this membrane was removed. In previously healthy women the retention of the decidua had no influence on the course of childbed, and did not hinder normal involution. He believes that it is the floating pieces of membrane which cause hæmorrhage, and that these should be removed.

Breathing of the Aborted Fœtus.—Glöckner³¹⁷_{No.1} notes the fact that a very young fœtus may breathe after delivery. This occurred in 3 cases of the fifteenth, fifteenth, and nineteenth weeks, respectively. In the first of these there were six respiratory movements before and five after severing the cord, the fœtus living one hour. In the second case the fœtus lived an hour and a half and breathed five times. The third fœtus lived but half an hour and breathed eight times. The autopsy showed the presence of air in the stomach, but the lungs were empty.

VOMITING OF PREGNANCY.

Cause.—Kaltenbach³⁴_{Oct.28} believes that many cases of hyperemesis gravidarum are due to a nervous disposition,—an exquisite hysteria which must be treated by physical means. In support of this theory he cites a case in which the passing of a bougie into the stomach, with the statement to the patient that the source of her trouble was now gone, effected a cure.

Another case reported by Hirst²³_{Nov.} was relieved in a similar manner. The patient had been vomiting for some weeks and the attending physician had tried all the usual medical remedies. Following Hirst's examination the patient made a prompt recovery without treatment. The investigation by a strange physician had given stimulus enough to the nervous system to overcome the condition.

Flaischlen³¹⁷_{No.46} states that the rapid loss of strength in this condition is largely due to malnutrition, but that it is also dependent upon a grave alteration in the nervous system, especially some reflex from the uterus which influences the innervation of the heart, and, further, a nutritive disturbance of the heart-muscles which may lead to collapse.

Hadra,⁷⁶⁰_{Apr.5} reasoning from the experiments of Alt,⁴_{No.25, '89} who found that morphine injected hypodermatically appeared in the

secretions of the stomach, suggests that this may be the explanation of the vomiting of pregnancy. A poison or toxic principle poured out into the stomach would excite irritation there and result in vomiting. Jones⁷⁶⁰_{Feb. 15} calls attention to the fact that in the obstinate vomiting of pregnancy there is not only the change in blood peculiar to the puerperal state, but also those changes peculiar to starvation. Strsalko and Eliasberg⁵³⁰_{B. 33, No. 2} report a case of hyperemesis due to a hydatid mole in a I-para 21 years old. After all remedies to control vomiting had utterly failed, abortion was induced and a caviar-like mass expelled from the uterus. This was shortly afterward followed by collapse of patient, with icterus on the third day. Finally there was an exudate in the right parametrium, which disappeared in ten to twelve days. Nausea continued for some time after delivery.

Balin⁵⁸⁶_{No. 26}²⁰⁰_{Oct. 8} is of the opinion that the vomiting is due to a nervous disturbance developed in direct causal connection with conception. Uterine displacements, he thinks, have nothing to do with the condition. Jaffé⁴⁰⁴_{No. 396} places the vomiting of pregnancy, according to symptoms, under three heads: 1. The ordinary vomiting (physiological) in the morning, with general freedom for the rest of the day. 2. A severe form, in which the vomiting occurs during the day, the patient's nutrition, however, being little affected and the appetite continuing, as a rule, good. As soon as foetal movements are discerned this condition generally disappears. 3. Incoercible vomiting,—a rare condition and usually endangering life. This is characterized by three stages: (a) a burning thirst, pain in epigastrium, salivation, and hyperosmia; (b) fever, foul breath, albuminuria, with increase of other symptoms; (c) high fever, delirium, and disturbance of vision. The theory of a rigid os uteri as one of the causes of vomiting is not supported by Henske⁷⁸⁶_{Jan.} who states that in all the cases of this condition which have come to his notice vomiting has been absent.

Treatment.—Guéniot,²_{Jan. 4} believing that the vomiting is due to irritation transmitted from the uterus to the sympathetic system and reacting on the stomach, directs his treatment to these three sources: (1) to lessen the morbid excitability of the uterus, belladonna, cocaine, morphine, vaginal injections, cauterization, and dilatation of the cervix are employed; (2) the excitability of the sympathetic system is allayed by prolonged baths, bromine, cold to

spinal region, etc.; (3) great attention is paid to the diet. Solid food is completely dispensed with, and diluted milk, light broths, beef-tea, and the like, in teaspoonful doses every half-hour or hour, are given; alkaline waters, as Vals and Vichy, should be the only drink taken. Employed as a gargle and a drink, these waters frequently modify the symptoms. Fly-blisters over the epigastrium, cold to this region, avoidance of tight bands, etc., are also recommended. McCall¹³⁸_{Jan} again calls attention to the excellent effect produced by salol. It may be given in small, frequently-repeated doses.

Mitchell⁶¹_{July} reports a case in which the only remedy affecting the condition was opium, the vomiting, however, returning as soon as the effect of the drug wore off, Gottschalk⁴_{No. 40, '89} has had excellent results in 2 cases from the internal administration of menthol. The formula furnished by Weiss¹¹⁶_{Jan} is as follows:—

R Menthol,	1.0 gramme (gr. xv).
Spts. vini,	20.0 grammes (3v).
Syr. sacchar.,	30.0 grammes (3viiss).
M. et solve.	
Sig. : Teaspoonful hourly.	

Carney,²⁸⁵_{June} in a case of severe vomiting which had existed ten days, painted the vaginal wall and cervical canal with a saturated solution of cocaine, and placed a suppository containing 1 grain (0.065 gramme) of cocaine and $\frac{1}{4}$ grain (0.016 gramme) of morphine against the cervix. The application was repeated in eight hours, and there was no further return of the condition.

Elliott²⁷_{Nov.} has found that the administration of iodine in the vomiting of pregnancy is followed by marked relief of the distressing symptoms.

Gunther,²²¹_{May} has treated 5 stubborn cases of hyperemesis by electricity with good results. The anode, covered with sponge, is placed at the neck of the uterus, the cathode, a metallic plate 4 to 6 inches square, being held over the eighth and twelfth dorsal vertebræ. A current of mild intensity, from 2 to 5 milliamperes, should be employed for seven to ten minutes. In Gunther's cases vomiting usually vanished after the fourth *séance*.

Mitchell⁷⁶⁰_{Aug. 2} treated a case with the faradic current as strong as it could be borne for fifteen to twenty minutes for six days. One pole on the abdomen; the other, a uterine sound, was carried

into, but not through, the cervical canal. Hæmorrhage and abortion followed the sixth application.

In regard to the mechanical treatment, Guéniot²_{Jan. 4} says that in many cases anomalous rigidity of the uterine tissue is only revealed by the effects of artificial dilatation or those caused by the friction of belladonna. He considers it advisable, therefore, to resort to methodical dilatation, even when the uterus appears normal. The finger is the best instrument, and the operation should be repeated during several days rather than employ violence.

Roberts⁴³_{Mar.} had a patient in whom slight dilatation of the cervix with a pair of dressing-forceps produced such great relief that she immediately fell asleep, after a wakeful period of forty-eight hours. The patient was better for four days, the condition then returning. A second operation afforded considerable comfort, nausea only remaining. Abortion finally took place in the seventh month of gestation.

In abnormal conditions of the genitalia, Hirst²³_{Nov.} thinks that as soon as it is evident that the condition is manifestly beyond the reach of ordinary treatment, one should not wait for the additional justification of extreme exhaustion before inducing abortion. Under these conditions, Pugliatti⁴⁹⁷_{Nov. 7, 8, '89} advises the use of a 6- to 10-millimetre-thick bougie carried 5 to 6 centimetres into the uterus. In two or three hours this is replaced by a bougie 2 to 3 millimetres thicker, and finally by a still larger instrument. This latter is to remain in several hours, until good uterine contractions result. He considers the practice safe, and the membranes are never ruptured. Loviot²⁴_{Feb. 10} relates an interesting case of a girl 19 years old, who was sustained for six weeks by rectal alimentation. There was emaciation, marked loss of strength, ptyalism, and bronchial expectoration. There was no fever, but a rapid pulse,—130 to 140. An hereditary tubercular diathesis beginning to assert itself, and all therapeutic measures proving futile, abortion was induced by bougie. Immediately following expulsion of the ovum the patient asked for something to eat. Kirk²¹³_{July} reports 2 interesting cases. In 1 there was marked pigmentation of the skin of the face and the exposed parts of the forearms, and the backs of the hands were nearly covered with irregular, dark patches, deeper in hue than the skin of the face. There was also a continuous band of the same pigmentation, irregular at the

edges and 2 or 3 inches broad, extending all around the loins and terminating on the front of the thighs and abdomen. In 1 case, associated with the vomiting, there was hemialbuminuria; in the other, diaceturia. In the discussion of Hirst's paper, already referred to, Price stated that he had never known a death, nor had any of his friends related one to him, from the vomiting of pregnancy. Balin's⁵⁸⁶_{No. 26} statistics, however, go to show that in its incoercible form it is a very serious complication of the gravid state, 44 per cent. of such cases terminating fatally. Flaischlen³⁹³_{v. 20, p. 81} reports 5 cases, 3 of which succumbed to the condition. Fatal cases are also recorded by Cornick¹²⁰_{June} and Braithwaite.⁹⁰_{July} McChesney⁷⁷⁹_{Oct.} saw death follow a slight hæmorrhage during abortion in a severe case of vomiting.

Groff¹⁴⁴_{Oct.} narrates a case of hyperemesis which supervened on an attack of sick-headache occurring in the seventh month of pregnancy. The patient had been subject to such headaches for twenty years or more. All remedies failed to affect the condition, and artificially-induced labor was determined on, but not carried out, as spontaneous miscarriage occurred. The vomiting continued, with more or less frequency, for twenty days. A week following delivery the patient developed melancholia, and three weeks later died. The reporter is of the opinion that some grave cerebral disturbance, which would also account for the long-continued attacks of headache, was at the bottom of the trouble.

DISEASES COMPLICATING PREGNANCY.

Albuminuria.—Our corresponding editor, Meyer, of Naples, calls attention to the observation of Land⁴⁹⁷_{Sept.} in regard to the occurrence of albumen in the urine during parturition. This condition he finds to be very frequent during the periods of dilatation and expulsion. The average amount of albumen excreted does not exceed 0.47 gramme ($7\frac{1}{2}$ grains) per thousand, and disappears immediately after labor or during the first few days of the puerperium. While offering no new explanation in regard to the cause, Land believes that the theories now extant are inexact or improbable. He states that there is no form of albuminuria met with during pregnancy similar to that occurring during labor. Chopard,¹⁰⁰⁶₉₉ from his study of 2 cases in Peter's clinic, arrived at the conclusion that the albuminuria of pregnancy is the result

of anatomical changes in the kidneys analogous to the early stage of parenchymatous nephritis. As a rule, these changes disappear with their symptoms immediately after delivery. Exceptionally the condition continues, and may go over into an interstitial nephritis. The cause of the renal changes is the increased work put upon the kidneys during pregnancy, in the increased intrarenal blood-pressure, as well as in the products of excretion which irritate the renal substance in passing. All the resulting changes are to be classed under the nephritis of pregnancy, which is to be included with the toxic nephritis.

Cotman²_{Mar.22} showed before the Hunterian Society the kidneys from a plethoric woman, aged 40, who had puerperal eclampsia and died comatose seven days after the birth of her tenth child. A condition of recent inflammation in an early stage was present, the pyramids being dark and the cortex swollen and soft. She had apparently recovered from the convulsions, and albumen had nearly disappeared from the urine, when fatal coma supervened.

Virchow⁶⁹_{Mar.6} exhibited at a meeting of the Medical Society of Berlin a microscopical preparation of fat-embolism of the pulmonary vessels from a case of eclampsia. Fatty embolism of the Malpighian glomeruli is also found in this condition. Virchow is not of the opinion that fat-embolism is the direct cause of eclampsia, but it is rather remarkable that this appearance is so frequently met with. It may, perhaps, be accounted for in the bruising of the fat-tissue of the pelvis received during labor.

Loviot²⁴_{Jan.22} insists that the urine of all pregnant women should be examined at frequent intervals, whether the patient presents symptoms of albuminuria or not.

Lomer³¹⁷_{No.43,99} reports 2 cases of albuminuria with impairment of vision, due to uræmia. In both cases, besides albumen, the urine contained granular and hyaline casts. In the first case the visual disturbance was due to uræmia associated with extreme general debility; in the second case there was retinitis albuminurica.

Swift⁹⁹_{June 26} reports 5 cases of uræmia. He is inclined to think that this condition is a more frequent complication of pregnancy than is admitted by Lusk (1 in 500). Herman⁶_{Nov.22} records 4 cases of albuminuria (Bright's disease?) in pregnant women without convulsions.

Griggs¹¹⁷_{Aug.} strongly advocates the use of chloroform internally in the albuminuria of pregnancy. The initial dose of 12 drops, well diluted with water, is gradually increased to 15 to 20, or even more, if the case is seen early enough in pregnancy. If near the date of delivery the largest dose may be given at once. As long as albumen is found in the urine the treatment should be persevered in, the dose of chloroform to be increased or diminished according to the increase or diminution of the albumen. Excellent results from this prophylactic treatment are reported.

Relation of Albuminuria to Puerperal Convulsions.—Gardner¹⁰²⁹_{Sept.; Nov.} has analyzed the histories of 180 patients,—96 I-paræ and 84 multiparæ. He found that $5\frac{1}{2}$ per cent. had albumen in the urine before labor, $12\frac{2}{9}$ per cent. the first day after labor, and $9\frac{5}{8}$ per cent. the eighth day post-partum. Albumen was found one or more times in 23 per cent. of the I-paræ and in $16\frac{2}{3}$ per cent. of the multiparæ. In 4 of these patients convulsions occurred, but in only 1 case was the presence of albumen detected before labor. In 3 cases albumen in large quantities appeared soon after the convulsions; in 1 case there was never any albumen present; and in 1 there was none present twenty-four hours after the convulsions. From his studies of these and other cases, Gardner concludes that albumen in the urine during pregnancy is not sufficient cause to base a prediction of probable eclampsia, nor, in its absence, is there evidence of the absence of other conditions which give rise to convulsions. Albumen is, however, so frequently found in the urine after convulsions that we are justified in making the statement that the convulsions are probably the cause of the albuminuria.

Scarlini,⁵⁷_{Dec. 15, '89} repeating Blanc's experiments, has isolated from the blood and urine of 2 eclamptics in the Siena Clinic a rod-shaped bacillus, cultures from which inoculated into gravid bitches at the end of gestation produced convulsions and the same symptoms seen in eclamptic women. Inoculated into non-pregnant dogs, the only symptoms produced were elevation of temperature, vomiting, and diarrhœa of short duration. Scarlini has found that the blood-serum in this condition is decidedly toxic, and therefrom concludes that eclampsia of pregnancy is of an infectious nature.

Richardson⁹⁹_{Feb. 6} has reached the conclusion that convulsions do

not occur when the kidneys are properly secreting, and that the presence of albumen and even casts are of little importance. Wood⁹⁹_{Feb. 6} thinks that the presence of albumen less than $\frac{1}{4}$ per cent. with casts of small diameter should occasion no anxiety, but when the amount of albumen reaches $\frac{1}{2}$ per cent. and casts of large diameter are present the patient should be carefully watched. Herman⁶_{Jan. 18} has closely observed 5 cases of eclampsia, with reference to temperature and urine. He found that the temperature was usually lowered after the cessation of the fits. All the cases had one feature in common,—a diminution in the excretion of urea during the period in which the convulsions were occurring. He therefore concludes that puerperal eclampsia is not a disease having a uniform clinical history or morbid anatomy.

Bright's Disease in Pregnancy.—Leyden^{309 132}_{v. 14, Jan.} calls attention to four important diagnostic points in this condition: 1. The disease appears exclusively in the second half of pregnancy and chiefly in I-paræ. 2. It increases proportionately during pregnancy and decreases after birth. 3. There is a nearly opposite proportional relation of the amount of urine to the intensity of the albumen. 4. The sediment consists mostly of hyaline casts, lymphoid cells, more or less numerous red blood-corpuscles, and sometimes granular casts, with single fat-drops and granules. Raven²_{July 5} reports albuminuria as having occurred in two successive pregnancies, the patient being perfectly well during the interval. Following the last pregnancy she began to show the early signs of Bright's disease. Halbertsma²⁷_{Oct.} places the maternal mortality in cases of eclampsia under his care at 17 per cent., 77 per cent. of the infants perishing. Trimble²⁷_{Aug.} has collected the statistics of 65 cases of eclampsia from eighteen physicians in two counties of Ohio. 50 of these cases were accurately reported. From this number he finds that where the convulsions occurred before labor, 33 $\frac{1}{2}$ per cent. proved fatal, 18 $\frac{1}{2}$ per cent. were fatal when the attack came on during labor, and 15 per cent. died following post-partum seizures. He believes eclampsia to be of much more frequent occurrence, at least in some localities, than is generally supposed. In regard to the treatment of this condition nothing new has appeared. Veit²⁷_{Oct.} prefers morphia, and reports that under this treatment he has never lost a case. The initial dose should be 0.03 or 0.04 ($\frac{1}{2}$ to $\frac{3}{5}$ grain), followed by smaller amounts to keep up the narcosis.⁴⁰⁴_{No. 304}

Rapid narcosis may be obtained by chloroform followed by the morphia. When the membranes remain intact they may be ruptured by Mondot's method. This consists in passing a flat metallic canula through the cervix, and allowing about 10 litres of a 1-per-cent. carbolic lotion to flow into the uterine cavity under gentle pressure.

Clark,⁸⁰_{Aug.} who was the first to advocate the maximum dose of morphia in eclampsia, writes that, while very few of the members of his county medical society would use the drug when he wrote his monograph in 1880, at present not one would think of any other treatment for eclampsia. Jones¹⁰⁵_{Oct.} also indorses this drug; Lockhart,²⁰⁷_{Oct.} Sabine,⁹⁹_{Mar.6} Crisp,²_{April 19} Rice,²_{June 7} Clarke,¹³⁹_{Mar.} Meachem,⁶¹_{Aug.23} and others report good results from venesection. Warriner⁴³⁰_{Jan.} uses Squibb's fluid extract of veratrum viride in 10- to 20- minim doses (0.65 to 1.3 grammes), hypodermatically, as often as necessary to reduce the pulse to 70 per minute. Kelly⁷⁶⁰_{April 26} and Willits⁴³⁰_{May} report successful cases treated by this drug. Thornton⁶_{July5} has employed nitro-glycerin with success. Hirst¹¹²_{July} treated 2 cases of eclampsia with the wet pack after venesection had failed to relieve. Each extremity was enveloped in a blanket wrung out in hot water; the trunk was also treated in like manner, and, lastly, the arms and trunk. A dry blanket was placed over all and cold applied to the head. Diaphoresis was profuse, and the patients recovered. Halbertsma²⁷_{Oct.} has performed Cæsarian section in eclampsia three times, with the result of saving the child in the first and both mothers and children in the last two. In Holland section has been resorted to six times, with fatal results to one mother and one child.

Constipation.—Max Flesch³⁴_{Oct.21} saw a case of eclampsia which he attributed to digestive disturbances. The patient had not evacuated the bowels for three days, and just preceding the convulsive attack had eaten inordinately of cabbage. There was but one seizure. A trace of albumen appeared in the urine on the evening of the following day and quickly disappeared.

Rochester¹⁷⁰_{April} was called to a case in the latter months of pregnancy, and found the patient writhing in pain. A tumor about 4 inches wide was discovered on the left side, extending about 6 inches below the border of the ribs and continuing with the spleen into the hypochondriac region above. Morphia was given to control the pain, and an enema of a pint of saturated solution

of Epsom salts injected high up into the bowel resulted in a tremendous discharge of fecal matter and disappearance of the tumor.

Jaundice in Pregnancy.—Hardie²⁶⁷_{May} reports 5 cases of acute atrophy of the liver occurring during gestation. All the patients were between 21 and 28 years of age; 4 miscarried before death; all proved fatal. As a cause, he assigns an altered condition of the blood, together with a peculiar nervous state,—possibly due to fear and anxiety at the prospect of child-bearing. As the result of malnutrition, the action of the various organs becomes retarded and the tissues altered. Under the microscope the blood-plasma appears full of minute granules and the red corpuscles lose their regular outline, being more or less shriveled and granular in their appearance. The white corpuscles also appear very irregular in shape, and the cell-wall is, in many cases, incomplete. This condition of acute atrophy, Hardie thinks, might better be termed an acute fatty degeneration. Grandin²⁷_{Apr.} saw a fatal case. The liver was enlarged. The fœtus was dead and jaundiced, and the liquor amnii of a deep-yellow color. Following delivery, there was vomiting of bile, restlessness, delirium, and death.

Loviot²⁴_{June 22} saw a case of slight albuminuria, followed by icterus some days before term. The albuminuria continued up to and through a second pregnancy, but there was no repetition of the jaundiced condition. Winter²⁷_{Jan.} relates a case where jaundice supervened in the sixth month of pregnancy after a mild malarial attack in the fifth month. Following the discoloration of the skin there was vomiting of a dark, bilious matter, pain in right side and shoulder, constipation, loathing of food, but craving for pickles and acid fruits. The patient miscarried. The breast-milk contained much bile.

Quinine in Pregnancy.—Bertrand²⁵⁶_{Nov. 16} states that quinine given during pregnancy is without effect on the uterus, and is incapable of producing abortion or premature labor. During labor it is an oxytocic of the first rank. It must be given at this period in large doses to produce the best effect. Corresponding Editor Strachan, of Kingston, Jamaica,⁶⁷³_{Jan.} who has treated a number of patients at the Kingston Hospital suffering from malarial poisoning, has never seen abortion follow the exhibition of this drug. Merz,⁸⁶²_{Jan., Feb.} on the other hand, arrives at opposite conclusions, and says that quinine, by setting up uterine contraction, may cause abortion during the

first three months of pregnancy. The action of quinine during the middle months of gestation is uncertain, but it appears to grow less harmful as pregnancy advances.

Displacements of the Uterus.—Halliday Croom,³⁶_{Apr.} with the thoroughness which is characteristic of the Edinburgh school, has investigated post-mortem the organs of a gravid woman who had suffered from uterine retroversion and flexion. The bladder was found enormously distended, due to the fact that the retroflexed body of the uterus occupied the entire pelvis. The urethra was not elongated, but the lower segment of the bladder was stretched and completely shut off from the rest of the cavity. There was distinct hydronephrosis of the right kidney, slight of the left. Contrary to the usual appearance depicted, the uterine cervix appeared markedly thinned. Henske⁷⁸⁶_{Mar.} saw a somewhat similar case. At four and a half months of pregnancy the retroverted uterus completely filled the pelvis and compressed the urethra. The bladder became enormously distended, reaching above the umbilicus. Attempts at replacing the uterus and passing the catheter proving futile, the bladder was aspirated 2½ inches above the pubes and the urine drawn off. It was still found impossible to replace the uterus, and abortion was induced, after which reposition was easily effected. Wenning²⁷_{Feb.} saw a case of dextro-torsion of the uterus in which the symptoms so clearly resembled ectopic gestation that the mistake was not discovered until laparotomy had been done. The patient aborted after the operation, and died three days later of purulent peritonitis, with occlusion of the bowel. Baird²⁰⁷_{July} reports a threatened abortion, due to the retroversion of a three months' pregnant uterus. The organ was replaced in the knee-chest position and the symptoms subsided. Hooper²⁸⁵_{Apr.} reports a case of partial retroflexion of the uterus complicated with a fibroid tumor. Two fingers only could be placed between the tumor and the symphysis. Cæsarian section was performed, with death of mother in seventy-one hours. Dührssen³¹⁷_{No. 51, '89} had a patient in whom there existed a partial retroflexion of the uterus, due to an intraligamentous fibroid tumor of the left side. The uterus was replaced and the growth removed by laparotomy by Gusserow. Abortion took place two days later, but the patient made a good recovery.

Cardiac Disease in Pregnancy.—Mackness³⁶_{Aug.} believes that the great source of danger in heart disease lies in the venous congestion,

systemic and pulmonary, the extent of the lesion being more important than its nature. Edge⁶_{Mar.5} records a case in which death occurred during extraction of the head (breech case) in the second stage of labor. Presystolic, systolic, and diastolic murmurs had been heard at the apex of heart. The patient was ill-nourished, tuberculous, and had suffered repeatedly from rheumatism. Näf²¹_{Aug.1} describes a case of fatal septic myocarditis occurring during pregnancy in a previously healthy woman. Klebs, who made the autopsy, was of the opinion that infection took place through the stomach and was mostly localized in the heart-muscle. Handfield Jones²_{Mar.15} again calls attention to the fact that hypertrophy of the left ventricle during pregnancy is due to the increased work entailed on the heart by the growth of the uterus and its contents, and if such compensatory hypertrophy is absent or insufficient symptoms of cardiac failure will develop during the progress of pregnancy. The condition of the systemic circulation depends largely on the mode of action of the left ventricle, and where this is feeble the blood-stream at the far points will be sluggish, and, the walls of the smaller vessels tending to become unhealthy, dropsy and small hæmorrhages are likely to take place and lead to abortion. The treatment in this condition consists in cardiac tonics, the recumbent position as much as possible, and avoidance of severe muscular exercise, with good hygienic surroundings, liberal diet, and stimulants.

Hæmorrhage in Pregnancy.—Kortright¹⁵⁷_{Oct.} has met with 4 cases of this rare condition, which occurred but three times in 22,498 deliveries at Guy's Hospital, and from which, of 106 cases collected by Goodell, 54 mothers and 101 children perished. The cause is a slight accident to an enfeebled, anæmic, or albuminuric woman; the symptoms are collapse, great pain referable to back, uterus, or placental region, feeble uterine contraction and increased uterine tension, with or without external hæmorrhage. The treatment should be instituted as early as possible. Johnson²⁷_{Nov.} narrates an interesting case of profuse hæmorrhage which occurred late in pregnancy, apparently the result of a sudden movement of the body and elevation of the legs in the act of lying down.

Influenza and Pregnancy.—Lwow⁵³⁰_{No.2} saw 2 multiparæ in the latter months of pregnancy abort on the fourth and fifth days of the disease. He states that the condition of the heart in

gravidae affected with "la grippe" is similar to that observed in other states of high body temperature. Of 3 pregnant cases observed by Müller,³¹⁷_{No. 17} 1 was seized with pains at the beginning of the attack and aborted, another was prematurely delivered, while in the third the course of pregnancy was not in the least interfered with. Trossat²¹¹_{Mar. 30} reports a number of abortions or premature deliveries resulting from influenza. In Amann, Jr.'s,³⁴_{Mar. 11} experience, "la grippe" affects pregnant women more lightly than others. In severe attacks the fœtus is killed, to be expelled several weeks later, or contractions are started and a living child expelled. In the parturient the contractions are more painful, but less effective.

Measles.—Lomer³¹⁷_{Nov. 30, '89} saw an interesting case occurring in a I-para five weeks before term. The day following the development of the initial symptoms labor set in, and the woman was delivered of a premature child. On the following day both mother and child exhibited the characteristic eruption of the disease. Rüter³¹⁷_{No. 28} mentions a case in which the disease resulted in a premature delivery in the ninth month. The child remained healthy and free from exanthem. Lawson¹⁰²_{Apr.} reports a case of premature delivery on the thirteenth day of the disease. The child showed no signs of measles. The mother subsequently suffered from thrombosis and embolic pneumonia.

Diphtheria.—Durand²¹¹_{June 22} saw diphtheria in a woman six months pregnant. Tracheotomy was performed and the patient recovered. Hirigoyen¹⁸⁸_{Dec. 29} reports a case developed on the second day post-partum and followed in six days by the eruption of measles.

Erysipelas.—Thiéry¹⁵_{No. 8} relates the history of a woman who suffered from a lymphangitis, which developed into erysipelas, with the formation of thirty abscesses. Associated with this there were icterus, obstinate epistaxis, high fever, and exhaustion. Two and a half months later miscarriage of a living child took place, and was followed by improvement and rapid cure. Blood from the umbilicus of the child, examined microscopically, demonstrated the absence of micrococci; thus showing the evident barrier the umbilical circulation opposes to the erysipelas cocci. In severe cases of erysipelas Thiéry recommends inducing miscarriage or premature delivery to effect a cure. Under strict antisepsis there is no danger of infection. In another case seen by Hurry²_{Oct. 18} the

patient was seized with sudden severe headache, pain in limbs and loins, shivering, rapid pulse, fever, and anorexia, two weeks before term. Twelve hours later she was delivered of a child; on the second day post-partum facial erysipelas developed, followed on the twentieth day by deafness and serious discharge from left ear. Subsequently the patient has twenty-six epileptiform convulsions, but finally recovered. There was no albumen in the urine. Smith²⁷_{Oct} had a case which passed through a severe attack of erysipelas of the knees, with the formation of abscesses. The labor occurred less than a month after the last abscess was opened. The puerperium was uneventful.

In the case of the typhus bacillus, the umbilical circulation does not appear to offer the same resistance to its transmission from mother to child as in the case of the erysipelas coccus. Giglio³¹⁷_{No. 46} obtained the bacillus from cultures made from the placenta and aborted fœtus of a mother suffering from this disease.

Leukæmia.—Sänger⁹⁵_{B. 33, H. 2; July} adds another to the scanty list of cases of leukæmia occurring in the gravid and puerperal states. The patient was 32 years old, unmarried, and in the second or third month of pregnancy. For two months she had complained of abdominal distension, with darting pains in the left hypochondrium, and increasing sense of fatigue. Before impregnation menstruation had been regular and scanty. The abdomen was much distended, and an immovable, insensible tumor was found on the left side, extending from the hypochondrium down to within two finger-breadths of Poupart's ligament, and laterally to the middle line. Percussion showed encroachment of the tumor upward and backward upon the thorax. There was a marked increase of leucocytes in the blood,—white : red = 1 : 15. The abdominal distension finally became so distressing as to necessitate induction of labor, which was followed by great relief from symptoms. The child was well developed, neither the spleen nor liver being enlarged. Blood taken from the placenta was leukæmic, while that taken from the cord was not. The patient died some time afterward.

Sänger also mentions an instance where a healthy mother bore a leukæmic child. Jaggard⁹_{July 19, '90} reports an interesting case of this variety, which developed a few weeks after confinement and terminated fatally within a year.

Chorea.—Pantzer³¹⁷_{No. 32} exhibited before the Gynæcological Society of Dresden a case of chorea in the sixth month of her fifth pregnancy. The patient had also suffered from the condition in her third and fourth pregnancies, for which abortion had been induced. In the present pregnancy, as no disease was discovered which threatened the mother or child, the patient was put on the usual treatment for such cases, avoiding the bromides, which tend to favor post-partum hæmorrhage. Subsequent labor was normal and the patient recovered.

Epilepsy.—Nerlinger³¹⁷_{No. 18} has collected 97 cases from the literature, to which he adds 4 from Freund's clinic. Pregnancy has very little influence on the disease, and is rarely interrupted by the attacks. Epileptics do not often have seizures during labor, but the attacks are not so infrequent as supposed. Primiparæ are those generally afflicted, and, as a rule, there is but one seizure during the first or second stages of labor. Suckling is not advisable. The marriage of epileptics should be strenuously opposed, as cure from child-bearing has not been proved.

Tetany.—Herman⁶_{Apr. 5} saw at the London Hospital a case of tetany in a woman who had had six children and two abortions. There was a history of vomiting, loss of appetite, constipation, and wasting, with cramps in calf of left leg and spasms of both upper and lower extremities. On admission to the hospital both hands and forearms were in tonic spasm. The urine contained albumen. Death took place in three months, when it was found that subacute nephritis was present, and the pylorus was surrounded by a tubular mass of cancer.

Hydrorrhœa Gravidarum.—Mynlieff³⁵⁴_{v. 26, p. 70} presents an exhaustive communication on this subject, in which he has collected the literature, discusses the various theories as to etiology, and presents cases observed by himself.

Antisepsis.—From an experience of 1100 polyclinic deliveries, 78.5 per cent. of which were operative, and under the most unfavorable conditions, Freund⁴⁷⁵_{Nov.} concludes that, although of rare occurrence, auto-infection may take place and is generally severe. His own success—not a single death from infection—undoubtedly lies in the scrupulous antiseptic precautions taken in each case of delivery.

Fürst¹⁰⁴⁷ has brought together in a very convenient form the

modern knowledge of prophylactic antisepsis, and its application to the pregnant, parturient, and puerperal patient and the new-born child.

OBSTETRICS.

BY WILLIAM H. PARISH, M.D.,

PHILADELPHIA.

ANTISEPTICS.

Tarnier and Vignal²_{p. 68} have made, at the Paris Lying-in Hospital, a series of bacteriological and clinical experiments concerning antiseptic substances. Their conclusions are that the most powerful antiseptic, in small doses, and therefore rarely dangerous, is corrosive sublimate; next come copper sulphate and carbolic acid, followed by mercuric biniodide, and finally permanganate of potassium. In order to obtain an almost perfect antiseptic condition, a uterine injection should be given immediately after parturition; vaginal injections are insufficient.

In the section of obstetrics and gynæcology of the Tenth International Congress the subject of antisepsis in midwifery was discussed at length, the first paper being by Galabin, of London.²⁷_{Sept.} According to this author, the rate of mortality in English maternities since the introduction of sublimate is 2 to 1000, instead of the former rate of 10 to 1000 (total mortality); deaths from septicæmia or pelvic inflammation, 1.5 to 1000. The number of cases in which slight elevations of temperature occur after delivery has fallen one-half. But the gain over earlier times is most striking in the percentage of the septic forms of fever. Their proportion in the London General Maternity sank from 40 to 2.5 per cent. In that institution the patients lie on horse-hair mattresses without beds. The mattresses need to be sterilized only when a case runs an unfavorable course; that is, proves septic. For vaginal irrigation a sublimate solution of 1 to 4000 is not strong enough; for the first three or four days it should be twice that strength. Fluosilicate of sodium is much inferior to sublimate.

For private practice, the same rules apply as regards hands and instruments; no examination should be made unless the hands

are washed in 1 to 1000 sublimate solution. For the lubrication of the hands a sublimated glycerin solution of 1 to 1000 is best.

Galabin thinks that in normal cases a single post-partum vaginal irrigation with sublimate solution 1 to 2000 is sufficient, but that during the entire puerperium 2 to 2½ per cent. carbolic irrigations should be used. Where one of the graver obstetric manipulations is required, or fever sets in, vaginal irrigations 1 to 2000 should be used for at least four days. The most important part of antiseptics in private practice consists in the most thorough disinfection of the hands of the physician and midwife.

Slawjanski, of St. Petersburg, submitted the report from 52 Russian maternities. In the four years 1886-'89 the number of deliveries in the 52 maternities was 76,646; the number of puerperal diseases, 6363, or 8.57 per cent. The puerperal mortality was 290, or 0.38 per cent. In order to appreciate the influence exerted by the special arrangements of each institution on the number of diseases and deaths, Slawjanski makes five subdivisions: 1. Obstetric clinics of the medical faculties. 2. Maternities connected with schools for midwives. 3. Maternities not so connected. 4. Obstetric wards of hospitals connected with schools for midwives. 5. The same not so connected. The statistics of the year 1889 are: Number of labors in the 52 institutions, 21,280. Of these, 6019, or 28.7 per cent., were primiparæ; 14,890, or 71.26 per cent., multiparæ. Operations were performed in 3103 cases, or 14.47 per cent. Complications (eclampsia, placenta prævia, rupture of the uterus) occurred in 290 cases, or 1.36 per cent. The puerperium was free from fever in 85.66 per cent. of the cases; single elevations of temperature were observed in 7.44 per cent. of the cases, repeated elevations in 6.9 per cent. Deaths from puerperal diseases, 60, or 0.28 per cent.; from non-puerperal diseases, 100, or 0.46 per cent.

The following are the author's deductions from this material:

1. In Russian maternities antiseptics is universally employed, so that the puerperal morbidity and mortality decrease in them year by year, and at present show a very satisfactory rate, namely, as above, puerperal morbidity, 6.9 per cent.; puerperal mortality, 0.28 per cent.
2. Where the antiseptic precautions are strictly and scientifically employed, the presence of students should have no influence on the morbidity and mortality of the institutions.

3. With the steady application of the same antiseptic precautions, the number of diseases and deaths depends upon a greater or less frequency of pathological, operative, and complicated deliveries in the institutions. 4. Large maternities under strict antiseptics are of more use to the country than small institutions.

Stadfeld (Copenhagen) dwelt chiefly on the question of midwives, and thought that probably another generation will pass by before we shall have the class of midwives we desire. At present we may be sure that where a midwife has assisted a physician in a case of difficult labor, it will form the starting-point of an epidemic.

William T. Lusk ⁹⁹_{May 29} states that hospitals, which were formerly the seat of violent outbreaks of puerperal fever, are now the safest places for women in labor. At the Emergency Hospital, in New York, which was an old engine-house adapted somewhat to such purposes, there were, during five years, 837 confinements and 16 deaths, of which only 1, and a possible second, concerning which the record is indefinite, were due to sepsis.

The following precautions were taken to secure these results: Upon entering, the patient was given a full bath. A rectal injection was given, and the lower abdomen, inner surface of thighs, anus, and groins were scrubbed first with soap and water, then with a corrosive-sublimate solution (1 to 1000). A vaginal douche of soap and water was given, followed by the corrosive-sublimate solution (1 to 4000). In operative cases this was repeated before and after the introduction of instruments or hands.

Internes were not allowed to visit contagious cases or places while on duty here. Both internes and nurses were required to wash their hands and arms as far as the elbow with soap and water, then plain water, and finally with the corrosive solution (1 to 1000). Infrequent examinations were advised. Instruments were washed in a 2-per-cent. carbolic solution, boiled, and then polished, after they had been in use.

The placenta was expelled by Credé's method, and ergot administered. A douche of corrosive solution (1 to 5000) was given, and in case of high-forceps operation, or operation requiring manipulation, as version, the irrigation was carried into the uterine cavity, a vaginal douche being first employed. The external parts were then dusted with iodoform and covered with a piece of gauze

freshly wrung from a corrosive solution (1 to 5000); outside of that it was customary to place a pad of oakum, which was changed every six hours, and the external genitals at the same time carefully washed. No douches were given during childbed. This method had prevented puerperal sepsis, and also reduced disease in general; and the temperature seldom reached 100°.

The vaginal douche is not employed during labor. One should be careful in employing irrigation to use a mild current, otherwise germs might be carried from the vagina into the uterine cavity.

In private practice one should be sure to have good laundry work, and prefer to use the oakum pad, which can be destroyed. A physician should not attend cases of acute infectious diseases, as erysipelas or diphtheria, at the same time he is caring for obstetric cases.

In true puerperal fever, frequent douching is bad treatment, unless there is reason to suppose there are clots or some foreign matter in the uterine cavity. For intra-uterine irrigation Lusk employs a bichloride solution (1 to 3000), injected slowly; the uterus should contract well.

ANÆSTHETICS.

Chloroform and Ether.—In the course of a discussion on anæsthetics at the Glasgow Medico-Chirurgical Society, ²¹³Reid observed that chloroform and ether were equally valuable for securing thorough anæsthesia in operative midwifery. For the administration of chloroform he preferred a single ply of flannel on a small wire frame used with a drop-bottle. In this way a mild degree of anæsthesia could be readily kept up, and deepened in a minute or two if required. In the case of ether he advocated the use of Clover's inhaler as the only safe plan. He had, indeed, substituted ether by the open method when a patient seemed very weak, and no bad result followed. On the only occasion, however, when he used ether during a lengthened operation the patient was ill for a fortnight afterward with bronchitis and congestion of the lungs. The ether was administered on a sponge in a waterproof cone. Ether had been given in a recent case by Clover's inhaler with perfectly satisfactory results. While he always examined the heart before giving an anæsthetic, yet the knowledge that heart

disease existed only made him more anxious to use chloroform or ether, "because in such cases the strain of a severe labor is vastly more dangerous without an anæsthetic than with it. The same holds good with regard to diseases of the kidney." After five-and-twenty years' experience of anæsthetics in midwifery cases, Reid said he had never seen a fatal issue. While his experience with chloroform had been very large, that with ether had been just as limited. "A lying-in woman is peculiarly fitted for escaping the dangers usually connected with anæsthesia. The left ventricle of the heart is considerably hypertrophied, and so less likely to weaken readily in its action. She is kept in the recumbent position, and so, to that extent, defended from syncope. The action of the heart is aided by the alternate relaxation and contraction of the uterus, and, lastly, the anæsthesia tends to produce anæmia of the brain, whereas the labor pains give rise to an engorgement of that organ. These causes, taken together, seem to me to account for the great rarity of fatal results in connection with obstetrical anæsthesia." He is inclined to believe that there is some truth in the assertion that chloroform may kill a lying-in woman by inducing post-partum hæmorrhage. That danger, however, can be quite set aside by the use of the subcutaneous injection of ergotin and by manual compression of the uterus. He has good reason for believing that chloroform has no danger to the fœtus. He admits it is hard to explain why, with chloroform circulating in the blood of the mother, the fœtus should not run a good deal of risk. He comes to the following conclusions: "1. In severe labor and the ordinary operations I am content to use chloroform, in view of its convenience and safety in those circumstances. 2. In long and severe operations, especially where there is much loss of blood, I prefer ether, given by means of Clover's inhaler. This involves more trouble, but its probable greater safety ought to turn the balance in its favor. 3. I hold strongly the belief that, while it is advisable to have two medical men present when an anæsthetic is given, it would be wrong to enforce this by law."

Charpentier¹⁹⁴_{No. 6, '99} sums up his personal experience in the following propositions: 1. Chloroform given in small doses produces a condition of physical and normal calm in the patient. 2. If the inhalations are prolonged for a considerable time the result will

usually be an attenuation of the uterine pain. The perceptions of the patient become less keen and the uterine contractions are slower. 3. If the period of complete anæsthesia is reached, with analgesia, there is surgical and not obstetrical anæsthesia. 4. In some cases chloroform excites instead of calming, and in such cases its use should be discontinued. 5. In some cases chloroform has unquestionably diminished the retractability of the uterus, and has thus been the cause of more or less severe hæmorrhage after labor. 6. Chloroform has no action upon the fœtus. 7. Chloroform given during the period of expulsion has a less decided effect upon the contractions of the abdominal muscles and the resistance of the perineum than is generally supposed. The sensation of pain at that period is not entirely abolished, the contractions are frequent, and Charpentier has failed to notice that which has been called by Campbell dissociation of the sensations of touch and pain.

Chloroform is especially indicated: 1. In primiparæ who are nervous and excitable, and in whom the pain may even cause delirium; also in those with whom the labor is greatly prolonged, thus becoming a source of danger. 2. In all cases in which there is spasm, contraction, or rigidity of the neck or body of the uterus. Contra-indications are the absence of severe suffering, the existence of placenta prævia, general prostration, disease of the circulatory or respiratory organs, cerebral disease, alcoholism, etc. During the period of dilatation chloroform is most required, but only to the extent of obstetric anæsthesia, as a rule. It sometimes gives rise to nausea, vomiting, headache, and various nervous troubles. Hæmorrhage is not likely to result unless the anæsthesia is profound. Chloroform cannot cause convulsions; on the contrary, it is one of the best means for relieving them. It may also be useful in warding off puerperal mania from those patients in whom the intense pain of parturition might lead to such a result. Dutertre has found reports of 40 cases of sudden death during labor attributable to chloroform, but of that number 13 should be eliminated as irrelevant. Of the others, some had cardiac or pulmonary disease, some suffered from alcoholism, and in others the narcosis was too profound.

A first condition in the use of chloroform is that it be chemically pure; death from respiratory syncope may follow the use of an impure article. Small quantities should be given, the

patient being in the horizontal position, and there should be an interval between successive inhalations. Subcutaneous injections of antipyrin, 0.25 gramme (4 grains) at a dose, have been used in a number of cases to produce obstetric anæsthesia. Chiari and Guéniot report good results from its use. Various mixtures have been suggested, in most of which ether, chloroform, or chloral is an element. Doléris has advised the local use of a 5-per-cent. solution of cocaine muriate to mitigate the pain of labor, but the author expresses his views upon the subject as follows: 1. Nothing can be applied to relieve the pain caused by the distension of the lower segment of the uterus, which causes the pain felt during the contractions. 2. Applications of cocaine may give relief if they reach the nerve-endings of the supra- and infra- vaginal portions of the cervix and the nerves of the vagina. Thus the pain of dilatation may be modified. 3. For the pain produced by compression of the nerve-trunks of the pelvis no application will avail. 4. The pain in the vulva and vaginal mucous membrane during expulsion may be somewhat modified by local applications.

As to the value of hypnotism in parturition it must have a limited range. Of 13 cases in which it was tried it was successful in only 4, the patients all being of a hysterical temperament.

J. F. Baldwin^{233 Aug.} makes a plea for the more frequent use of chloroform in obstetrics. He has kept statistics of over 600 confinements. He is accustomed, during the first stage of labor, to administer morphia; during the second stage, chloroform; during the third stage, nothing. His experience warrants him in stating that the advantages of chloroform are: that it not only relieves pain, but also shortens labor, usually; prevents shock, prevents nervous and physical exhaustion, reduces the liability to rupture of cervix and perineum; does not conduce, in any material degree, to post-partum hæmorrhage; does not affect the fœtus; is absolutely safe when properly administered.

W. R. Cushing^{81 Jan.} says that explanations of its safety have been made time and again, the chief stress being laid upon the enforced recumbent position during its administration. This, doubtless, should have some weight, but is not satisfactory in itself, as occasionally death would occur were there no other reason preventing it. A much better explanation is the condition of the circulation during a pain. As described by a recent writer:

“At the very time that you are administering the anæsthetic most freely—that is, during the increment of a pain—at that very moment the contraction of the uterus is driving blood back upon the brain—a forcing-pump refilling the cranium, should your chloroform be removing the blood too freely from it.” That is a very reasonable view to take of the matter; but there is one respect in which a labor pain differs from any other, viz., *it culminates in a forced expiration*. This fact alone would prevent an overdose in the hands of a careful attendant. As usually administered, it is withheld during the interval, until the indications of an approaching pain are apparent. It is then offered to the patient, who, after making a few deep inhalations, ceases to inspire, holding her breath until the height of the pain is reached. The chloroform is then withdrawn, and she is allowed to breathe air until the approach of another pain. Continued inhalation is necessary for a fatal effect, and this the nature of the pain prevents, whether the drug be withdrawn after two or three inspirations or not; provided, of course, its administration be stopped at the *close* of a pain and the woman be allowed to recover from its effects in the interval. Death from chloroform so administered would seem to be impossible in the case of a woman in ordinary health, suffering from no organic trouble of the heart or other organs.

Chloral.—Playfair²_{p.715} believes that chloral is a remedy of almost incalculable value in prolonged first stage, and one which practically supersedes all other methods of dealing with this troublesome complication. He has been constantly using it since 1874 with the best results. Since that time he has practically never had any trouble from the thin, rigid cervix. Under the use of this agent the pains become longer, steadier, and more efficient; the patient falls into a somnolent condition, dozing quietly between the pains, which are not lessened or annulled, as is the case when chloroform is inhaled freely; and, above all, the wild state of excitement, which is so frequent in this class of labor, is calmed and soothed, to the infinite relief both of the patient and practitioner. Nor is it necessary to administer doses of any unsafe amount. Fifteen grains (1 gramme), repeated in twenty minutes, either by mouth or rectum, is generally sufficient to produce an effect lasting over several hours. Possibly a third dose may occasionally be required, but never more. Another great good follow-

ing this practice is that, when the expulsive stage is reached, the patient being already in a state of semi-anaesthesia, very much smaller quantities of chloroform or of the A C E mixture are required than would otherwise be the case. Since using chloral in this way Playfair has never had occasion to give opiates either by the mouth, rectum, or hypodermatically, and he believes them to have the disadvantages of tending to arrest uterine action altogether, instead of steadying or even increasing it, as is the case with chloral.

Antipyrin.—Misrachi ²⁴_{Jan.} has used antipyrin to alleviate the pains of parturition in 21 cases, obtaining notable relief in only 6 instances. He concludes, from his experience, that it is not an obstetrical anæsthetic. Its useful action is only obtained in certain painful complications of labor, such as uterine contractions, accompanied by exaggerated pain, as is observed in posterior positions of the vertex, premature rupture of the membranes, spasmodic contraction of the cervix, etc. If the action of antipyrin is inconsiderable in the pains of labor, it has, on the other hand, a very marked effect upon the after-pains. Whatever may be the cause of these pains, antipyrin has succeeded in more than 80 per cent. of the cases, and its action is absolutely constant when the pains are provoked and kept up by the administration of ergot. He makes only one exception to this rule, and that is in cases where there is a retention of a portion of the secundines or a clot. In such cases the first thing to do is to empty the uterus and give hot irrigations, after which the antipyrin may be given with excellent results in relieving after-pains.

PLACENTA PRÆVIA.

Two cases are reported by C. G. R. Naylor, of Burmah, India, ²⁵⁹_{Dec.} 1 in a primipara, due, according to the author, to the fact that the patient, from the beginning of pregnancy, was obliged to ascend a steep bank to reach the town from her residence. Thereby the ovum may have slipped to the lower segment and inserted itself around the internal os of the cervix uteri.

Kolff and Treub ¹⁶²_{Sept.} ²_{Jan.17} record the results of this malpresentation as observed by them at Leyden. Between 1856 and 1879, 26 cases of placenta prævia were noted by Kolff, with a mortality of 42 per cent. On the other hand, between 1887 and 1889 Treub

has observed 13 cases. In all of this series he performed combined version, losing only 1 patient. The fatal case cannot fairly be attributed to the method of delivery, for the woman died of pyæmic phlebitis, set up by a dirty sponge which the midwife introduced into the vagina to check the hæmorrhage before version was performed. Hence the mortality did not amount to 8 per cent. Of the children, 8 (or 61 per cent.) died, but 4 must be subtracted, as the heart-sounds could not be heard before version; thus the precise mortality was 30 per cent. During childbed bad results were observed only in cases that had been previously examined by midwives, except in one instance, where the vagina had been plugged with sterilized absorbent gauze instead of iodoform gauze. The great principle of practice at Leyden is to separate version from extraction. The former is undertaken in order to save the mother. It is only in cases of subsequent hæmorrhage that extraction by the feet is carefully undertaken. Kolff praises that practice, as it renders interference practicable very early in the labor, before the mother is exhausted by hæmorrhage, saves her from the risks of prolonged plugging, and allows the latter part of labor to continue slowly, and yet without danger. The risk of post-partum hæmorrhage is thus greatly lessened. The risk to the child is theoretically great, yet the above statistics prove that the infantile mortality is not very high.

H. P. Newman reported 5 cases to the Gynæcological Society of Chicago. ²⁷_{July} In 1 of these the patient died after the administration of chloroform by a local physician, and Newman considers this a dangerous agent in cases where there has been much hæmorrhage and the patient is exsanguinated and anæmic. He urges the use of nitrous-oxide gas in such cases.

At the annual meeting of the North of Ireland Branch of the British Medical Association, Dempsey ²_{July 20} read the notes of a case of placenta prævia which he had treated successfully by the introduction of a large piece of solid alum up against the os, and maintained in close contact with it by a vaginal tampon. He claimed for it a number of advantages: 1. It produces constriction of the uterine sinuses by hardening and contracting the uterine fibres in the lower segment of the uterus, against the outer surface of which it is in contact. 2. It appears to assist in causing thrombosis of the sinuses. 3. It produces a tenacious,

mortar-like coagulation of the effused blood, which acts as an additional tampon in the vagina. 4. It does not prevent dilatation. 5. From the limited experience with it, it appears to obviate the necessity for the usual operative measures required in placenta prævia until the os is sufficiently dilated to permit of them with safety. In the case in point the patient was a multipara between the seventh and eighth months of pregnancy; active hæmorrhage was going on before the introduction of the alum, yet none occurred afterward, though the placenta was central, and dilatation had proceeded almost to the full extent. The alum had been left in for seventeen hours. Immediately after its removal violent hæmorrhage again occurred, but delivery by version was easy of accomplishment without any injury to the maternal structures. The use of alum was recommended more than fifteen years ago by R. Beverly Cole, of San Francisco, Cal., in this and other hæmorrhagic disorders of the organs of reproduction. He termed it the "alum plug."

Alderson²_{Nov. 8} read an account of 2 cases in his practice. Both patients were multiparæ over 40 years of age, and in both the placenta was more or less centrally attached, while both suffered from several attacks of bleeding. In both the initial symptom was severe, and sudden flooding, commencing without warning during sleep, between the sixth and seventh months of pregnancy. The first patient was a delicate woman in her tenth pregnancy; the labor was terminated, after a second attack of flooding, by rupture of the membrane and delivery by the long forceps. There was no bleeding either during or after delivery. Chloroform was administered, but not to complete narcosis, and in both cases so much of the placenta was separated and removed as was within easy reach of the finger. The second case terminated quite naturally upon the fourth day; but in examining the after-birth, which was much atrophied, thinned, and flattened, it was noticed that a large portion of its uterine surface had been removed, as was mentioned, during the early stage of labor. Alderson had found both ergot and bromide of potassium of service in arresting or preventing bleeding in cases of post-partum hæmorrhage, after the flooding had been stopped by the separation or removal of as much of the placenta as could be reached by digital exploration, in the manner recommended by Barnes. This practice had invariably

stopped the hæmorrhage, time was gained, and either external version or turning could be employed, while the partial separation of the placenta did not necessarily cause the death of the child. On one occasion he had removed the entire placenta after an alarming flooding, and then turned, when speedy recovery followed. In such cases puncture of the membranes was usually recommended as a routine treatment, though the operation might be performed too soon. Plugging the vagina was objectionable, owing to the septic complications which might ensue.

In the treatment of 6 consecutive cases of placenta prævia occurring in his practice, A. P. Clarke, ⁷⁰⁰_{June 21} recognized the fact that the ectasia of the vascular development in the cervix was not uniform. In the area of growth in almost every case, some portion of the marginal implantation was much more limited than others. After ascertaining the point offering the least resistance, and where the vessels were the smallest, he effected separation of the placental attachment sufficient to admit the index finger. Firm tamponading to guard against undue hæmorrhage from the open vessels was resorted to. After inserting one or two fingers between the tampons and the detached portion of the placenta, the membranes were sought for. If the cervix was hard and unyielding, no attempt was made to rupture the membranes until evidence was had that the cervical tissue was soft and yielding and the lower segment of the uterus contracted at intervals. The administration of ergot was not followed with beneficial results. Kneading or regular massaging the uterus above contributed greatly to the relaxation of its lower segments. The binder was employed. As the fundal and equatorial zones of the uterus contracted, the lower ones relaxed. On the occurrence of this condition, the tension of the placental vessels was found to be greatly diminished.

Until the birth of the child was complete, connection of the placenta as far as possible with the cervical tissue was maintained. By the employment of this method of treatment in the 6 consecutive cases of central implantation of placenta prævia, not a single death of the mother occurred, and only 1 death among the children. The cause of the death of that fœtus, however, was not due to the existence of placenta prævia, but to hydrocephalus in the child. The mother was phthisical, and the placenta was

found to have undergone fatty degeneration. In 2 of the cases of this series, hæmorrhage occurred at the close of the seventh month; in 2, at the close of the eighth month; in 1, after the eighth month; and in the last, near the close of the ninth month.

Lennander, of Upsala,¹⁶²_{Oct.} describes 3 cases of placenta prævia, 1 followed by a formidable complication. A woman who had borne 2 children had lateral placenta prævia at her third labor. The orifice of the cervix was wide enough to admit several fingers. Podalic version and immediate extraction was practiced. During the puerperium, fever with pain in the region of the symphysis set in. The linea alba immediately above the pubes was incised, and an abscess the size of a child's head was thus opened. It contained pus of a penetrating odor. The symphysis parted, and pieces of bone and interarticular cartilage came away. Lennander did not feel certain whether the parting of the symphysis was the result of the suppuration or had developed during delivery, an abscess forming subsequently. The sacro-iliac synchondroses remained unaffected. The symphysis pubis united again during convalescence.

MECHANISM OF LABOR.

In a well-digested article on the "Utero-vaginal Angle and its Influence on the Mechanism of Labor," Rutherford, of Burlington, Vt.,²⁷_{Dec.} concludes with the following theory as to the progression of the child under the influence of this anatomical landmark: The head starts in the oblique diameter of the pelvis, descends in a straight line through the uterine axis to the floor of the pelvis, where it comes in contact with the levator ani muscle-trough and rotates into the antero-posterior diameter. When it reaches the bottom of the trough it stops, as it can go no further in that direction. Then extension begins: the occiput is forced around the utero-vaginal angle until the head is fully extended, by which time the occiput emerges under the pubes, and immediately afterward the head is delivered. Meanwhile, the shoulders come down, rotate, are forced around the angle, the body is bent laterally, and the shoulders are delivered; and in the same manner the hips are delivered. After delivery of the placenta the parts resume their former relation, and, with the exception of the enlarged uterus, appear as they did before pregnancy.

MANAGEMENT OF LABOR.

The Fetal Head.—Kalkowski, ⁹⁵_{B.39,11.3} alluding to the estimation of the size of the child's head before birth, agrees with Fashbender that the child's head is a reproduction of the mother's head in miniature. He found in 428 measurements a remarkable resemblance of the infant's to the mother's skull. So constant is the relation between the two that the child's head can be estimated before birth, in the majority of cases, as follows: The bi-temporal diameter is 4.5 centimetres less, the bi-parietal is 5 centimetres less, the suboccipito-bregmatic diameter 5.5 centimetres less than the corresponding dimensions of the mother's.

Vicarious Labor Pains.—G. B. Johnston, of Richmond, Va., ¹³⁷_{Aug 20} reports the case of a woman to whom he was called fifteen or twenty days before her expected confinement (a multipara), who complained of severe poroxysmal pain in the right side of the neck and extending to the chest near the margin of the axilla. It proved to be an erratic labor pain. An examination was not granted. On visiting her the next morning he was surprised to find that the child was born, and all had been accomplished without a single uterine pain. The pains in the chest increased in length and intensity, the intervals growing shorter until the gush of waters, immediately following which was the birth of the child.

Lingering Labor.—Playfair ²_{p.716} begins a most interesting dissertation on the modern methods of managing lingering labors by affirming that it is the bounden duty of the practitioner to avail himself of every means in his power to insure his patient an easy and short labor, with as little suffering as possible, provided only he is satisfied that the means he adopts are such as are not in themselves likely to prove injurious. In a case prolonged in the first stage from a rigid and undilated cervix, the difficulty arising either from non-dilatation caused by inertia, by irregular and cramp-like pains, premature rupture of the membranes, adhesions of the membranes, or overdistension of the uterus from excess of liquor amnii, our predecessors recommended an energy of practice very much at variance with their theory that delay was of little consequence. Blood-letting was the first resource, then came tartar emetic in nauseating doses, large hot baths, and other such means, all of which may be placed in the limbo of obsolete remedies.

Opium was advised occasionally, and no doubt is useful in certain cases, but has the disadvantage, no matter in what form it is administered, when given in sufficient quantity to be really useful, of temporarily arresting the pains. It is to be noted that in the vast majority of such cases there is no real obstacle in the cervix. This will always dilate readily enough provided the expulsive powers be properly acting, and in dealing with this our first object will be to ascertain, and if possible remove, the cause which is interfering with the normal progress of the case. The relief of the acute pain, the calming of the excitement attending it, the lessening of spasmodic uterine action, which is one of the chief causes of non-dilatation of the cervix, and the relation of tissues, are all promoted in a most marked degree by the use of anæsthetics used locally and by inhalation. The value of this at the proper time, during the expulsive stage, is very great; but chloroform, especially when given overfreely, has, in his experience, the disadvantage of distinctly retarding labor by lessening uterine action, and thereby causing inertia. It is too strong an agent for the first stage, and not sufficiently prolonged in its action.

Among mechanical means used in undilated os, manual dilatation with the finger long held a prominent place. Trenholme, of Montreal, has pointed out a sound practical observation—that separation of the membranes by sweeping the finger round the inner surface of the os frequently remarkably promotes dilatation. When the head is pushed low down into the pelvis, the os being soft and relaxed and the membranes ruptured, gentle manual dilatation, pushing, as it were, the os over the head, is frequently extremely useful, and may very materially expedite the progress of the case. It requires, however, some judgment and some practical experience as to the proper cases in which it is to be used, for when rashly or roughly practiced it may do much harm. Pushing up the swollen anterior lip, when impacted between the head and the pubes, is not only legitimate, but essential, to save injury to the os. The gentle pressure of the finger is obviously much less likely to be hurtful than the long-continued bruising to which the uterine structures would otherwise be subjected. Lastly, the mechanical dilatation of the os by caoutchouc dilators may but rarely be of service.

In prolonged second stages, the head being in the pelvic

cavity and the labor simply delayed from want of expulsive pains, the two most prominent changes are the almost entire disuse of oxytocic drugs, such as ergot of rye, and the more frequent use of the forceps. In every text-book of thirty or forty years ago a large amount of space is given to the indications for the administration of ergot. No practitioner went to a labor without it, and, although it was admitted to be not quite free from some risk to both mother and child, no doubt was expressed as to its great utility. Its tendency to produce tonic and tetanic uterine contraction, and therefore seriously to imperil the life of the child, is now universally admitted; and this property, invaluable in the third stage of labor after the birth of the placenta, has of late years been almost universally admitted to be an absolute contra-indication to its use in the second stage. Playfair considers the drug an unsafe agent, and that its effects are too much beyond our control, and that therefore its disuse is a distinct scientific gain.

An entirely modern oxytocic, first brought prominently into notice by Kristeller under the name of "*expressio fœtus*," is manual pressure applied directly to the uterus to increase the force of feeble pains, or even to take their place when they are entirely absent. The idea, however, is a very old one. That pressure applied to the uterus is of great utility in labor may be inferred from the fact that in some form or another it is almost universally found to take a part in the obstetric customs of savage tribes. Thus, among the Kalmucks a woman sits behind the patient, and, passing her arms round her, squeezes the uterus during the pains. Very similar expedients are commonly used among Mexicans and the natives of various parts of Africa. In some cases the pressure is applied by an assistant seated in front of the patient, with the hands spread out on either side of the uterus; in others the uterus is clasped from behind, whilst in some cases pressure is applied by bandages passed round the abdomen. A practice so widely spread must have in it an element of utility.

For many years past Playfair has used uterine expression regularly wherever he found it necessary to intensify feeble uterine action, and is satisfied that with proper limitations we have in it a most valuable addition to our resources. The best way of using it is, he thinks, for the practitioner to stand by the side of the patient (who is in her usual position on her left side), and to

spread his left hand over the fundus. When the pain comes on, strong downward pressure is made in the direction of the axis of the brim. If the finger of the right hand be placed simultaneously on the head *per vaginam*, it will be felt to be pushed down in a very marked way. He has often in this manner pushed the head through the brim, where it had long been delayed, and on to the perineum in two or three pains; and on more than one occasion, when called to a tedious labor with the view of delivering by forceps, he has avoided the use of the instrument by this means, and rapidly terminated the case. It is needless to say that this expedient is only applicable in the second stage, after the rupture of the membranes, and when it is known that the pelvis is of full size, and that there is no resistance from the soft parts.

R. Bell²_{p.715} recommends the employment of strychnine in small doses, repeated three times daily for a fortnight or three weeks prior to confinement. In his experience it had a most wonderful effect in promoting uterine action and expediting labor. This he had frequently demonstrated in cases where previous labors should in all cases be used when the head did not move with the pain. Strychnine was dangerous to the child's life if given before labor, though useful in hæmorrhage and abortion. Its action was often useful in bringing the head in the position to travel easily over the brim.

W. Walker²_{p.756} is of the opinion that a sedative, as opium, is of great service in those cases at the commencement of labors where there are spasmodic pains acting very little, if at all, in dilating the os. In many cases it would be found to give the patient some hours' rest and relieve the practitioner from constant attendance, labor afterward progressing smoothly and safely to a termination. In the second stage it is important to diagnose the position of the head; a case of lingering labor is often speedily terminated by altering the position of the head with the forceps from the third or fourth position to the first or second. It is then often found that very little, if any, assistance other than the natural powers is required to complete delivery.

Heywood Smith²_{p.669} draws attention to a usage of the Polish midwives in cases of delay in labor, owing to a rigidity of the os in the first stage. They frequently smear the cervix with a small quantity of extract of belladonna.

F. S. Watson ²_{Feb. 1} attended a primipara aged 30. The nurse stated the waters had broken two days before. The os was dilated to the size of half-a-crown, and the parts were moist. No progress having been made thirty-four hours later, notwithstanding every effort to bring on delivery, including the administration of chloroform, the pains being strong and the parts hot and dry, he decided to terminate the labor by incising the os. "I first applied the forceps to steady the uterus, then made incisions anteriorly and posteriorly to the extent of about $\frac{1}{2}$ inch; the child's head was now forced through before I could make more. The rest was natural, the uterus contracting well. The child was dead. After-treatment consisted merely of careful diet and syringing every four hours with Condyl's fluid. Temperature remained normal, the patient making an uninterrupted recovery, being up on the tenth day, and now perfectly well."

In a paper read before the Obstetrical and Gynæcological Society at Berlin, ⁹⁵_{H. 3, p. 27} Dührssen advocated deep incision of the cervix. In the discussion which followed, it is interesting to note that the procedure was severely criticised and condemned in so far as it concerns the wide application recommended by Dührssen. Olshausen voiced the opinions of many in remarking that incisions of the cervix are probably too little practiced at the present time, but their use is limited to cases of peculiar rigidity of the cervix, when the incision may be very useful. It is uncalled for in conglutination of the cervix. In the extension of these indications he was of the opinion that Dührssen had gone altogether too far. To undertake such incisions before the cervix has dilated, and even when the head is above the brim, and to follow them with immediate delivery by the forceps, is to throw overboard the foundations of obstetrical operations. Indeed, to recommend anything of the kind is to be considered questionable, dangerous, and shows very little experience.

An instrument of great promise in this connection is the atmospheric tractor, recently perfected by P. McCahey, ¹⁹_{Nov. 29} who claims that it will be the substitute for the forceps in obstructed and tedious cases. The operation is described as extremely simple. "It consists in applying a cup or concave disk of rubber or other air-tight flexible material to the child's head, so that it will be firmly affixed to the head by atmospheric pressure, and then

making traction on the handle of the cup or disk. Any amount of desired power can be obtained by using a cup of sufficient area." The tractor can be applied to any portion of the cranium. It is practically a clamp which can be attached to a large area of the surface, placing the head under the absolute control of the physician and enabling him to move it about in any direction he may choose. Before applying the tractor, it is necessary to see first that the cervix is sufficiently dilated to allow of its introduction. A hand pressed on the abdomen keeps the head from receding. The tractor is then introduced within the vagina or os, and firmly pressed against the child's head until the handle or vacuum-producer has driven out all the air from within the disk or cup. By grasping the handle, extraction can then be proceeded with. Should the head be dry, as sometimes happens, it must be moistened with water or oil. The tractor may be applied with absolute safety over either the bony parts of the skull or over the fontanelles. There is no danger of detaching the scalp; neither is there any fear of infection if ordinary cleanliness be observed. Several forms of tractors have been tried, some with a ball-valve, others with an air-cock that could be attached to an exhaust-pump. McCahey has used the tractor in 5 cases, and on each occasion has effected delivery within five minutes.

Head Presentation.—Hunt¹⁰⁵_{Oct} reports a case complicated by dorsal displacement of the arm. A well-developed multipara (fifth) had been in labor under the care of a midwife for thirty-six hours. The membranes had ruptured about twenty-four hours previous to his visit, and the pains had been long and severe, but ineffectual. On examination, he found the head presenting normally but remaining high up in the pelvis and no progress made by the uterine contractions, but could discover no reason for the delayed labor either in the child or mother. As the patient was completely prostrated by the prolonged and inefficient contractions, which were now weaker and spasmodic in character, and as the liquor amnii had largely escaped, the forceps were resorted to.

After anæsthesia with chloroform, another examination was made, but he was unable to get his hand high enough above the vertex to find any cause for its failure to descend. The forceps were applied with no great difficulty and by their aid a 10-pound boy was delivered, and as his head and shoulders emerged from

the vulva the cause of the dystocia was made evident in the displacement of the right arm, which was thrown across the back of the child's neck. This undoubtedly caught on the brim of the pelvis, preventing the further descent of the shoulders.

Brow Presentation.—G. E. Luster¹⁴⁹_{Apr.} states that all authors which he has consulted on this subject pass brow presentation—a presentation of the fetal cranium midway between flexion and extension—with but slight mention.

When we consider the diameters involved in this presentation, we find it absolutely incompatible with safe delivery in a normal and fully-formed child, from the known fact that a larger body cannot pass through one of smaller dimensions. We have the occipito-mental or long diameter of the head, which is $5\frac{1}{2}$ inches, in relation to or antagonized by the conjugate of the brim, which is $4\frac{1}{2}$ inches; or the transverse of the brim, which is $5\frac{1}{4}$ inches; or the oblique, which is 5 inches; or the conjugate of the cavity, which is $5\frac{1}{4}$ inches; or the transverse of the cavity, which is 5 inches; or the oblique of the cavity, which is $5\frac{1}{4}$ inches.

According to the position of the brow, whether anterior, transverse, or oblique, these diameters must be encountered in the passage of the head through the pelvis, to say nothing of the encroachment on these diameters by the psoas and iliacus muscle, and other soft parts with their investments, which reduces the diameter of the brim $\frac{1}{2}$ inch and those of the cavity and outlet $\frac{1}{8}$ inch. These, then, are the diameters involved where the brow presents and its axis comes into relation with the pelvic axis. According to strictly mechanical deductions, one of three things must of necessity occur. The uterine contractions either change the position and bring down the occipital or mental end of the fetal ellipse, or, what did actually occur in his experience, after long and patient waiting with vigorous contractions in a patient with ample pelvis, no progress. The resources of nature becoming exhausted, artificial delivery became necessary. Luster reports 2 cases to illustrate his point.

Ear Presentation.—H. J. Garrigues⁵_{June} reports the only case he has seen of this presentation and reviews the subject. The head may be bent so much toward one of the shoulders above the line of the pelvis that the ear presents. The head may either be approached at the anterior or the posterior shoulder. In the first

case the sagittal suture is found running transversely from side to side, near, close up to, or above the anterior pelvic wall; the posterior parietal bone and the posterior ear present themselves at the brim of the pelvis. In the second case, the sagittal suture runs in a similar direction near the promontory of the sacrum, and the anterior parietal bone and ear present themselves. These presentations are called the *right and left anterior and posterior parietal presentation*; or, since the ear is easily felt, the *anterior and posterior ear presentations, right or left*. As a rule, in these cases the pelvis is narrow, but, even with a normal pelvis, an anterior ear presentation may be caused by anteversion of the uterus and pendulous abdomen. Under other circumstances the causes are unknown.

In most cases the prognosis is favorable, as the head either changes its relations to the body under the influence of labor pains, or is manually replaced by the accoucheur. But if the abnormal attitude continues after the waters have broken, the situation is a serious one, as the head cannot pass through the pelvis when so placed. If feasible, podalic version and extraction are indicated; if not, the head must be diminished by means of perforation and evacuation.

Shoulder Presentation.—The knee-chest position is strongly advised by E. F. Wells²⁷ to facilitate turning. He shows by a number of illustrative cases not only the great value of the method, but, also, that the plan has been suggested independently to many practitioners. The impaction of the shoulder in many cases forms a serious obstacle to turning. By inverting the patient the abdomen is relaxed to the greatest possible extent, the pains are less powerfully expulsive, the uterus is lengthened in its long and shortened in its transverse diameter, and the impacted shoulder is drawn away from the pelvic brim by the force of gravity. Correction of the malposition is greatly facilitated by the shape of the uterus and the ease with which any operative manipulations may be carried out. The os should be well dilated or easily dilatable. The hand is introduced into the vagina, the membranes are ruptured if yet intact, and pressure is made upon the shoulder toward the child's pelvis, in the direction of the foetal and uterine curves, and away from the superior strait. Simultaneously pressure is made externally upon the foetal head or breech, as seems needed.

Under this procedure the shoulder soon passes out of reach and the head takes its place at the pelvic brim. The woman is now raised upright upon her knees and supported in this position until the head becomes fixed (usually by the next pain), after which she assumes the ordinary obstetric position. In rare instances it may be found impossible to bring down the head, when the breech may be made to engage, or, if this be impracticable, podalic version may be resorted to.

James L. Kortright, of Brooklyn,⁵⁹ Apr. 19 reports the following case: Mrs. L., aged 22, multiparæ, was delivered February 28, 1890, of a large male child. The only point of interest was in the birth of the shoulders. After the head was born, restitution took place, with the child's face looking toward the maternal right thigh, as is normal in first position of vertex. The anterior shoulder lodged above the symphysis pubis. Delivery was finally effected by the anterior shoulder rotating into the hollow of the sacrum and the posterior and lower shoulder passing under the pubic arch, so that the child's body made a complete semi-revolution and the face at last looked toward the maternal left thigh. In the revolution the face turned toward the bed.

Transverse Presentation.—Julius Soloweitschyk¹_{Oct. 4} suggests that in transverse positions an effort should always be made to effect turning by external manipulation, and if this does not succeed the combined turn must be made, trying to bring the head forward. He believes that in most cases the occipital turn can be effected, except, perhaps, in cases of contracted pelvis.

Breech Presentation.—At a meeting of the Society of the Alumni of Charity Hospital, held March 11, 1890, Edward L. Partridge¹_{Mar. 22} showed a specimen illustrating one of the dangers incident to the use of traction in breech deliveries—that of separation of the proximal epiphysis of the femur. He urged the necessity of making the labor as slow as possible up to the time of the engagement of the head, and the superiority of expressing over traction after that, as not interfering with proper flexion of the head. He thought that in the great majority of cases there was no occasion to hasten the labor until the trunk was expelled as far as the umbilicus, but, of course, compression of the funis would call for haste at any stage.

Fürst⁹⁵_{Nor.} strongly recommends the use of forceps in delayed

breech cases, in preference to the fillet or blunt hook. The forceps should have a large cephalic curve, and the points of the blades should come close together. Traction should be made only during the pains, and then the force of uterine contraction and the pressure of the soft parts will tend to prevent slipping of the blades. The instrument is used, therefore, simply to supplement an inefficient driving force.

Kjos,¹⁰⁵_{Apr.} being called to a case delivered by a midwife, found the scrotum of the infant lacerated and the testicle protruding and greatly enlarged. He learned that it was a breech presentation, and the midwife, not recognizing the fact, took the presenting parts for the bag of water, and in attempting to rupture it had taken hold of the scrotum with thumb and index finger, and thus by a twist of the hand the accident occurred. The spermatic cord was ligated and the testicle removed, and the child recovered in about three weeks.

Simultaneous Head, Hand, and Foot Presentation.—Ensor,²_{Apr. 19} reports a difficult case of turning rendered easy by placing the patient in the genu-pectoral position. The patient was a primipara, in labor at term, presenting not only a hand, but also a foot and the head, the last being impacted in the pelvis, having forced down before it the posterior segment of the partially-dilated os and cervix uteri, which it was injuriously compressing between itself and the promontory of the sacrum. The membranes had been ruptured a long while before, and the uterine contractions were nearly incessant. Patient declined chloroform, and being on her left side, after attaching a tape to the presenting foot, he tried with the left hand in the vagina to push the head above projection of sacrum, but without success. It then occurred to him that if he placed her in the knee-chest position, so as to allow the womb and its contents by virtue of their weight to fall forward and downward, turning might be made easier. By doing this he was enabled to complete the operation with the greatest ease imaginable, very slight pressure of the head with simultaneous traction on the leg being alone required. The child, which was of average size, was, as might have been expected, still-born.

The Forceps.—Gibbons,¹_{May} in a review of 50 cases of parturition, protests against indiscriminate hastening. The following rules seemed advisable: 1. Never use the forceps until full

dilatation of the cervix. There are few exceptions to this, for a 10-grain (0.65 gramme) dose of ipecac, $\frac{1}{2}$ grain (0.03 gramme) morphine, in $\frac{1}{2}$ ounce (16 grammes) camphor-water, or chloroform inhalation will generally relax a rigid os. In hæmorrhage, eclampsia, or exhaustion, it may be unwise to wait. 2. Rarely apply the forceps in occipito-posterior positions until rotation has taken place, as delivery usually results in death of the child and extensive laceration of the perineum. 3. Do not hasten delivery when the head is on the perineum, especially in primiparæ. The dilatation of this structure must be gradual. It is true that with the forceps the advance of the head may be controlled and the perineum be saved, but it is often otherwise. 4. Invariably use the Tarnier forceps when the head is high in the pelvis. Regarding the effect of instruments upon the child, the subject is not treated very fully by any author: 1. Not necessarily endangering life, we have contusion, laceration or separation of the scalp or integument, injury to the eyeball, paralysis of the facial nerve. 2. Endangering life, compression of the brain, apoplexy, depressure or fracture of the bones of the skull, pressure on the veins of the neck, and pressure on the cord. Many of these injuries can be guarded against, and are only likely to occur in careless or inexperienced hands. Many arise from improper application or slipping of the forceps. The latter is inexcusable, but it is quite a different thing to avoid pinching a loop of the cord between the head and the tip of the blade where there is no means of ascertaining the fact, and he believes that this is a not uncommon cause of still-birth. The action of the fœtal heart may lead one to suspect it, and he is in the habit of applying his ear to the abdomen of the mother in all forceps cases. In his own practice he could trace 14 still-births due apparently to this cause. He therefore felt like uttering a warning against the application of the forceps unless absolutely necessary.

Robert L. Dickinson^{1 Oct. 4} describes a sheet-sling for forceps deliveries. The crutches devised to steady the flexed lower limbs during operations do their work well, but are too cumbrous to carry. A satisfactory substitute is a sheet rolled and passed behind the neck and under the bent knees. The thighs are flexed as far as possible. The extreme flexion of the knee gives the ham such a solid grip on the sheet that no sidewise slipping

can occur, and the knees can be adjusted at any distance apart. The patient balances herself. She cannot kick. It is very useful in low forceps-deliveries, in breech-extractions, in easy versions, in restoration of the perineum, and in major operations. For Sims's position it should go back of the shoulder on the upper side.

Playfair,²_{p.756} at the annual meeting of the British Medical Association, expressed the fear that, although the forceps had done much to prevent the indefinite prolongation of labor that used to characterize ancient practice, he was by no means sure that the pendulum had not swung too far in the opposite direction. "When I hear of men who put on the forceps in every fourth or fifth labor, I cannot help fearing that they may have been tempted to their use, perhaps unconsciously, with the view of saving their own time, rather than because they considered them essential for the welfare of the patient."

The Obstetric Binder.—E. P. Davis⁷⁶⁰_{Jan. 25} considers the usefulness of the binder as entirely dependent upon the physical conditions of the patient. In a strong, healthy woman with well-developed abdominal walls, a binder is unnecessary if there is no lack of tonicity after delivery. On the other hand, if the parietes lack tonicity and are not well developed, or if there is danger from post-partum hæmorrhage, it should be applied firmly and efficiently. There is a belief in the minds of many women that the binder preserves the figure, and it may be well to apply it in all cases to satisfy this idea, unless there are special reasons for not doing so.

An interesting discussion took place on this subject at the London Obstetrical Society. The uses of the binder cited by Herman, who introduced the subject, were comfort, maintenance of the intra-abdominal pressure, and preservation of the "figure." The maintenance of the intra-abdominal pressure has been thought to prevent flooding. As to this, the author did not believe that this effect could be relied on, and some speakers agreed with him. Measurements of the base of the chest showed the latter to be practically unaffected by the binder. Except as regarded the comfort of the patient, the use of a binder was a matter of indifference. The general result of the discussion seemed to favor the opinion that the support of the abdomen during the post-partum

involution of its walls was not a matter of indifference, and that the binder was, after all, a valuable safeguard against "pendulous belly" when properly used.

Rupture of the Linea Alba during Labor.—F. W. Mousell, of Port Pirie', South Australia, ²⁶⁷_{Dec.} reports a case in which, immediately after labor, he found a longitudinal opening in the linea alba through which he could sink his fingers into the abdominal cavity, the intestines bulging out on each side of his hand. He carefully adjusted the binder every day, and the intestines gradually sank back into the abdominal cavity. The patient made an excellent recovery from the confinement, and on the 11th of June, when he last examined her, her condition was as follows: A longitudinal opening in the linea alba extended from about 3 inches from the ensiform cartilage to the pubes, the widest part of the opening being from 1 inch below to 2 inches above the umbilicus, and being about $1\frac{1}{2}$ inches wide. It could only be felt perceptibly when the patient was directed to make a slight effort to rise from a recumbent into a sitting posture.

Rupture of the Uterus.—Hirschfeld ²_{Aug. 50} describes this complication in a multipara: The amniotic fluid had escaped three days previously. The fœtus took a transverse position; the medical attendant tried turning unsuccessfully, and then decapitating, also unsuccessfully. The woman was then removed to hospital in a collapsed condition, and examination showed all the signs of rupture of the uterus. The fœtus was in the second-shoulder position, the left hand in the vagina, and the shoulder wedged in the pelvis. The rupture was on the left of the cervix, 3 centimetres from the internal os, and permitted the introduction of the whole hand into a large cavity filled with clots and covered by the peritoneum of the left parametrium. Decapitation was at once performed, and removal of the fœtus and placenta. The rupture was packed with iodoform gauze, also the uterine cavity, and a good bandage was applied externally. The patient did well. On the sixth day the temperature was only 38.2° C. (100.3° F.); on this day the dressings were removed. Some ulcerations of the vagina were touched with iodine tincture and the vagina washed out with thymol solution, after which she made a good recovery.

Rupture of the Vagina.—G. B. Taylor ⁹_{Oct. 18} reports the case of a stout multipara, aged 39, who had been suffering from a large

umbilical hernia and uterine anteversion. The patient having jumped out of bed, severe pains set in, and then suddenly ceased with the sensation of "something giving way." With two fingers in the vagina, the os could not be reached. Passing in the entire hand, the uterus was found well contracted and entirely empty, as after the completion of an ordinary labor. The aperture of the os was transverse, with a shallow notch on the right side. Passing behind the cervix, the finger-tips came in contact with the smooth peritoneal covering of the sacral prominence. There was a large rent in the vagina, passing posteriorly half-way to the vulva and anteriorly to the cervico-vaginal junction, and gaping widely at the sides. The rent gave the impression that the tissues had parted transversely across the vaginal vault, and then longitudinally in or near the median line toward the vulva. The rectum was empty. Baring the arm to the shoulder, the hand was passed behind the uterus into the abdominal cavity. The feet of the child were found beneath the spleen, the head lying in the left inguinal region. Delivery by the feet was accomplished with little difficulty. The cord was cut, and followed into the abdominal cavity up to the fundus and over and in front of the uterus. The placenta was beyond the reach of the hand, and where the head of the child had been, from whence it was lifted by means of the cord and removed through the vagina. The vagina was irrigated with a 1-in-40 carbolic solution. The amount of blood lost was trifling. Antiseptic precautions were used as far as possible before and after delivery, the surroundings and attendance being, however, such as to render them for the most part futile. The pulse never regained its normal rate or character, and on the tenth day after delivery she died. Death was doubtless due to heart-failure from febrile sepsis.

Parturient Uterus Torn from its Cervix by its own Contraction.—Guéniot and Thévard,²_{June 28} read before the Paris Académie de Médecine a case in the experience of the latter physician. The patient was rickety, with a contracted pelvis; the conjugate diameter was 3 inches. She had already borne two children. A few hours after the commencement of labor a very severe pain occurred; slight hæmorrhage and hiccough followed, but the general condition did not appear grave. Labor pains ceased entirely. On examination, a depression or solution of continuity could be felt

along the lowest part of the anterior wall of the uterus. The placenta lay at the pelvic inlet; no other part of the ovum was accessible, and the fetal heart-sounds could not be heard. It was not till the next day that any attempt was made to extract the fœtus, but only the trunk could be extracted through the vagina. Decapitation having first been performed, the abdominal cavity was opened and the fœtal head removed. The body of the uterus was found high up, its fundus lying under the liver. On the raw surface of the uterus below was a crown of ragged flaps, taken at the time for the vaginal attachments of the cervix. The uterus was placed in its natural position, the bleeding surfaces were washed with brandy ("the only antiseptic at hand"), and the abdominal wound was closed. The patient recovered. She was carefully examined afterward by Drs. Tarnier, Guéniot, Charpentier, and Budin, and it was agreed that the cervix and vagina were in a healthy condition. The uterus had torn itself at the junction of the cervix and the body, below Bandl's ring.

Detachment and Expulsion of the Vaginal Portion of the Cervix.—Hirst ^{9 June 13} describes a complication of this kind in a patient who was 34 years old and had had five children. Her labors had all been difficult, and, with one exception, instrumental, partly on account of a slightly contracted pelvis, but mainly because of unusually large children.

Labor began by rupture of the membranes, and rigorous uterine contractions soon followed. The os dilated unevenly; the anterior lip, nipped between the head and symphysis, remained thick, firm, and unyielding, but was not œdematous. After more than twelve hours of ineffectual uterine and abdominal contraction, a fleshy mass was discovered protruding from the vagina; it proved to be the vaginal portion of the cervix, lacking a small piece posteriorly. The head was found well down in the pelvis, and the child was extracted by forceps. Twenty-four hours after labor a vaginal examination was made. No trace of a cervix could be felt, except posteriorly, where a tongue of cervical tissue projected into the vagina. There was no hæmorrhage during labor or afterward, and the puerperium was uncomplicated except for a slight cystitis. At the time of writing, three weeks *post partum*, the tongue of cervical tissue projected from the median line posteriorly, the entrance to the uterus was reduced to its

ordinary calibre by cicatricial puckering in the centre of the vaginal vault, and the involution of the uterus had progressed normally. The dilatation of the os was, no doubt, prevented in this case by cicatricial infiltration, the result of injuries in former labors.

Separation of the Symphysis Pubis.—G. McNaughton ¹⁵⁷_{Apr.} reports what he believes to be the first case of the kind described in America. Nothing unusual occurred till labor began at term. For about thirty hours nature was allowed to take her course. The patient was in excellent condition, os dilated, pains regular and vigorous, but ineffectual. The head presented L. O. A., but was scarcely engaged at the brim. Simpson's long, double-curved forceps were applied within the uterus, the handles pressed well back on the perineum. Considerable traction was made without moving the head a particle. The assistant then took the forceps, McNaughton making pressure over the fundus. At the second attempt he thought he had started the head; at his third, both physicians were sure something had given way, for they were conscious of a distinct shock, and both thought that the forceps had slipped. On investigation such was found not to be the case, but the head had come down a little. Traction was again made, and a second sensation like the first was experienced. It was impossible to say whether or not an audible crack occurred. It was rather the feeling of something unusual through the sense of touch. The child was quickly delivered, and its arrival was followed by a tremendous gush of blood, which did not seem to come from the usual source. On examination, the finger passed through a slit in the anterior vaginal walls, to the right of the urethra (as afterward ascertained) up to the separated pubic arch. The points of bone were separated about 1 inch, and felt like bone denuded of its periosteum. A catheter was introduced, the urethra put in its normal position, held there, and the vaginal rent stitched together. No drainage-tube was introduced. A tight bandage was placed around the hips, the knees and feet were tied together, and an opiate was administered for the relief of pain, which was excruciating in the back and region of the symphysis pubis. A general peritonitis developed, which continued to grow worse until death, on the ninth day after delivery.

Successful Version in Articulo Mortis.—Hirst ²²_{May 24, '90} publishes the account of a woman in the last month of gestation, who evi-

dently had but a short time to live; there was no pulse at the wrist; the death-rattle was present; the eyes were opened, insensible and glazed. The foetal heart-sounds were still quite distinct and regular, and active foetal movements could be seen and felt. He advised the resident physician in charge of the case to dilate the cervical canal with his fingers, insert his hand, and do a version followed by immediate extraction; surmising, as it proved correctly, that the tissues of the dying woman could offer no resistance to these manœuvres. Although there was not the slightest dilatation of the os when the operation was begun, Sharpless, the physician in charged, extracted the child in less than five minutes. The woman died subsequently, but it was ascertained post-mortem that death was due to meningitis.

THE PLACENTA.

The Credé Method of Expression.—The Credé method consists in first applying light, and, afterward, stronger friction to the fundus of the uterus, until an energetic contraction is obtained. At its height the uterus is grasped so that the fundus rests in the palm of the hand, and the body is pressed between the thumb and fingers. The effect of external pressure thus exerted is to force the placenta from the uterus, or, in case of failure, the process is to be repeated. In experienced hands it is likely to be expelled by the third or fourth uterine contraction.

A statement had been going the rounds of the medical journals to the effect that Credé himself had abandoned the method. It was, however, anonymous, and seemed to be entirely without foundation. Statistics showed that the method did not increase the quantity of blood lost, and that unless resorted to too early it did not produce tearing and retention of the membranes; and if this latter accident should occur, it would not, with rigid antiseptic conduct of the labor, enhance the risks of puerperal fever. It seemed tolerably clear that, in most cases, during the first fifteen or twenty minutes after the birth of the child, the placenta left the uterine cavity either in whole or in part, and then offered all the conditions favorable for expulsion. But if left to the unaided efforts of nature, long delay usually took place after the placenta had sunk into the lower uterine segment; so that it was a good rule, accepted of late by Credé likewise, not to resort to external

manipulations until at least fifteen minutes had expired; some advocated a delay of thirty minutes.

While some of the leading men of Germany almost prohibited the Credé method, Lusk, of New York, ⁴⁰ thinks that the accidents attributed to it, such as post-partum hæmorrhage, retention of the membranes, and puerperal fever, had no foundation. As to how long the Credé method should be practiced, he said that personally he could succeed in expressing the placenta during the course of three or four uterine contractions in 99 cases out of 100. Where there was adherent placenta, and expression could not be effected in three or four pains, he would not hesitate to pass up his hand and remove it.

Forcible Extraction.—Barsoni ²⁷_{p.1032} reports a case in which a midwife removed a placenta by main force. Unconsciousness followed. For four weeks the woman suffered from puerperal fever, continual hæmorrhage, and pain. When she tried to exert herself she felt a swelling the size of an egg about the labia. Three months afterward Baselli was called in. Reposition with the hand and with the colpeurynter was tried many times, but unsuccessfully. Removal of the uterus was being seriously considered, when, as a last experiment, reposition, with the patient in the knee-elbow position, was tried, and succeeded in restoring the organ to its normal position.

The Placenta in Twin Labors.—Twins were born to a Mrs. M., residing in Lowell, one on January 24, 1890, and the other January 27th—fifty-three hours apart. There was a single placenta, the two cords being attached about an inch apart. No effort was made to remove the placenta immediately after the birth of the first child—as is customary. The first child was very delicate, and the mother said she thought that the birth was premature. Nature was allowed to take her course, and the birth of the second child was patiently awaited. The first child lived only two weeks, but the second was strong, fat, and healthy, and has continued so to this time. There could not, therefore, have been a premature birth. Lathrop, of Lowell, ²³⁴_{Dec} thinks that in many cases there would be a very considerable delay in the birth of the second twin, if there was no interference with nature. In the above case, while the patient and her friends were willing to wait for the birth of the second child, he had great difficulty in persuading them to allow

the placenta to remain undisturbed. With the first child the first stage of labor lasted five hours, the second stage half an hour. With the second child the patient was in easy labor about three hours. The os did not firmly contract during the interval.

Retention of the Placenta.—Rodriguez explains a theory of P. Gavilan, of Durango, with regard to certain cases of retention of the placenta by atmospheric pressure. He, in such a case, having introduced the hand into the uterus, found it impossible to loosen the borders of the placenta; so, with his fingers, he pierced the central part of it, when at once, before he had time to make traction, the after-birth lay loose in his hand. He thinks that when the edges of the placenta adhere too firmly, and traction is made on the cord, a vacuum is formed in the centre; when the air enters, by introducing the finger, the placenta is expelled. Certain cases in his own practice seem to confirm this view, and analogous cases have been recorded which might be explained by the theory adduced.

Adherent Placenta.—Pajot⁴⁸ read before the Obstetrical Society of Paris an extreme and fatal case of adherent placenta. The case occurred in the practice of Clopatowsky, of Bogota. He was called in after a lingering labor which had been mismanaged. Great quantities of ergot had been given, and after the birth of the child the umbilical cord had been torn off in attempts to extract the placenta. Clopatowsky found the uterus in a state of tetanic contraction, excepting at one point, probably the site of the placental attachment. Anodyne injections to check the uterine spasm and two attempts to detach the placenta manually proved failures, and some placental tissue was left behind. Rigorous antiseptic treatment was carried out; nevertheless, rigors, high fever, tympanites, and prostration set in, and the patient died on the third day. Clopatowsky asked if, in an extreme case like the above, where the risks from leaving irremovable portions of placenta were so great, it would not be justifiable to perform Porro's operation, the only way of getting rid of foci of infection. In the discussion which followed, Pajot considered that the proposition was justifiable. Skutsch, of Jena, had once carried it into effect. Budin recommended the careful kneading of adherent placental tissues with the fingers; by this method the adherent structures could be removed as far as the true uterine wall. Anti-

sepsis could afterward be carried out with facility. Charpentier insisted that the curette could be safely used in cases of total as well as partial adhesion of the placenta. The obstetrician could tell when the curette touched uterine tissue by the peculiar sound then produced. Pajot, on the other hand, declared that Charpentier's advice was perilous. In retention after abortion the curette was useful, but it was hardly safe in a case of complete and intimate adhesion of the whole placenta, as in the instance under discussion. There is no "peculiar sound" when the soft tissue of the uterus at term is scraped. So absolutely inseparable was the placenta in some patients (as he had verified by examinations in the dead-house) that no treatment short of amputation of the uterus appeared justifiable. Bonnaire also quoted a case where the curette completely failed. The patient died, and it was afterward found that the placental tissue was absolutely inseparable from the uterine wall.

POST-PARTUM HÆMORRHAGE.

In seeking for the cause of hæmorrhage, Schauta ^{88 132}_{No. 59; Apr.} advises that the practitioner remember that while atony of the uterus is the most frequent, other causes of equal importance may be present. Among them are failure of the uterine muscle to properly retract and close the mouths of the uterine sinuses; dilatation, degeneration, and atheroma of the blood-vessels of the uterus; retained portions of placenta; lacerations of the genital tract opening blood-vessels; varicose veins which have been ruptured during labor; bleeding from rupture of the uterus at the lower uterine segment; tumors, especially myomata and carcinomata, which become bruised and lacerated during labor. In the treatment of these cases it is essential that the placenta be delivered in such a manner as best to avoid uterine relaxation and hæmorrhage. Schauta wisely advises that no effort be made to express the placenta during the first half hour following delivery; he would even adopt Ahlfeld's suggestion, and allow two or three hours to elapse before removing the placenta manually. The Credé method is preferred when expression is possible.

In the treatment of hæmorrhage caused by uterine atony, uterine massage is indicated, and also hot douches; these are best given of sterilized water, or of some antiseptic solution, bichloride

of mercury not being considered applicable in these cases. Ergotine may be given by hypodermatic injection; the intra-uterine application of styptics is strongly condemned. The intra-uterine tampon of iodoform gauze is warmly commended, and has given none but good results in Schauta's hands. In cases where a hæmorrhage is persistent and severe, the blood coming from degenerated vessels in the site of the placenta, it may be necessary to adopt a procedure advised by Kocks. This consists in inverting the uterus as soon after the birth of the child as possible, and applying an elastic ligature about the cervix. In addition, iodoform gauze may be used as a tampon. After six hours the elastic band may be removed and the uterus replaced. When hæmorrhage results from retained portions of placenta, the thorough exploration of the uterus and the removal of such portions will promptly check the hæmorrhage. Hæmorrhage from lacerated wounds in the genital tract is best controlled by suture, or ligature, or by a gauze tampon. In the treatment of the anæmia following hæmorrhage, the transfusion of dilute saline solutions is especially commended. Schauta describes a case where, after laparotomy, severe hæmorrhage resulted; four hours after the operation the abdomen was again opened, and large clots and fresh blood were found. The hæmorrhage was checked, and the threatening anæmia of the patient was relieved by transfusion with salines.

Turpentine in post-partum hæmorrhage is prompt and efficient, according to a correspondent,¹³⁸ July, who saturates a piece of lint with spirits (oil?) of turpentine and carries it directly into the uterus, so as to bring it in contact with the inner surface. In one or two cases, where the patient was almost pulseless, it seemed to act as a stimulant; but on no occasion did it fail to instantly check hæmorrhage and produce contraction of the uterus. It is claimed to be quicker and safer than any other remedy. It does not produce any injurious result.

Dirska⁴_{p.173} extensively practices a method which he believes to be extremely efficacious in checking post-partum hæmorrhage. He first presses the fundus firmly with one hand; with the other hand he clears away all clots, and then slips into the uterus and upper part of the vagina two or three lumps of ice the size of a walnut. The pieces of ice are left in place for a few minutes. The uterus is subjected to pressure for about a quarter of an hour longer.

Dirska has always succeeded in checking the hæmorrhage at once and permanently by this method. He practiced it in over 30 cases of central placenta prævia, and all were saved.

Auvard²³⁶_{Dec.} considers Dührssen's plan of treating post-partum hæmorrhage by an intra-uterine tampon of iodoform gauze a safe and reliable treatment. He finds the mortality in 67 cases about 6 per cent.

The method of applying the tampon is as follows: The anterior and posterior lips of the cervix are transfixed and drawn downward with tenacula, and a strip of iodoform gauze carried by means of dressing forceps to the fundus. The other hand is placed on the fundus through the abdominal wall, while the cavity of the uterus is being filled with the gauze. The tenacula are removed, and the end of the gauze is left at the vulvar opening. The tampon should be removed in from twelve to twenty-four hours. He considers two grades of post-partum hæmorrhage, viz., bleeding of moderate severity and hæmorrhage alarmingly profuse.

In the former variety the loss of blood may be due to uterine inertia, wounds of the vulva, vagina, or cervix; and the treatment of these milder cases should include, besides ligatures and sutures, antiseptic injections of hot water, the administration of ergot, and the application of the utero-vaginal tampon. When the loss of blood is alarming, uterine inertia is the cause. The bleeding should be controlled by compression and massage of the uterus through the abdominal wall, by the introduction of the hand into the uterus to remove its contents, followed by the utero-vaginal tampon.

THE PERINEUM.

R. L. Dickinson,¹_{Apr. 5} after a personal study of 147 cases, invites attention to the following salient facts: 1. Primiparæ; slow delivery of head; lacerations, 15 per cent. (the usually quoted ratio is 21 to 34½ per cent.). 2. Primiparæ; 33 slow forceps deliveries; lacerations, 24 per cent. (many bad cases). 3. Multiparæ; slow delivery; lacerations, 6 per cent. 4. Multiparæ; nine slow forceps deliveries; lacerations, none. 5. Multiparæ; rapid delivery; lacerations, 33 per cent. 6. Primiparæ; rapid delivery; lacerations, 77 per cent. 7. Ten rapid extractions of head; lacerations, 100 per cent. (mostly breech cases). 8. Forty-nine forceps operations; lacerations, 20 per cent. 9. Only 1 rupture into rectum.

Whittle¹⁸⁷_{Jan} contributes an account of 50 cases of operative midwifery, with special reference to hæmorrhage and perineal support. From December, 1882, to April, 1889, the author's midwifery experiences were drawn from three sources: First, private practice; second, the out-door department of the Ladies' Charity; third, the in-door department or Lying-in Hospital. The aggregate number of cases within these dates amounted to more than 1000 labors. As there were 50 operations—being the series which forms the subject of this paper—it follows that the proportion of cases in which operative interference was indicated was less than 5 per cent. Out of 24 cases of obstruction from rigidity or contracted pelvis the children were saved in 19, and in no instance was perforation necessary. In 3 cases of arm presentation the death of the fœtus had preceded labor. Out of 5 cases of hæmorrhage, the infants were saved in 3. In the remaining 18 cases, where the chief symptom was exhaustion, protracted labor, or prolapsus funis, the children were saved. No death occurred among the mothers. Three of the cases of hæmorrhage were accidental and 2 the result of placenta prævia.

CRANIOTOMY.

F. A. Stahl²⁷_{Dec.} presents a new cranioclast, which he claims possesses, among others, the following advantages: It is light, weighing only 25 ounces. Its blades, being articulated, do not fall apart so readily. It requires no assistance other than that of the external hand to lock and unlock the blades. It can be manipulated with one hand. With its use the exploring hand is introduced fewer times. When articulated it becomes a perfect bone forceps. It exposes maternal soft parts to less violence. The exploring hand proves a better protector and informant with an easily managed instrument than with one less so. The operation of cranioclasm is shortened, simplified, and performed with less labor and more comfort to both mother and operator.

CÆSARIAN SECTION.

Lawson Tait²_{Mar. 22} for many reasons prefers to resort to a modified Cæsarian section, the main modification being amputation of the uterus after removal of the child and placenta, rather than to embryotomy, evisceration, craniotomy, and other mutilating opera-

tions when the fœtus is viable and the suspected labor is due to pelvic deformity. He describes his operation as follows: "The first step is the abdominal incision, 4 inches in length, involving first the skin and then the muscles down to the sheath of the rectus, all of which ought to be divided by a sharp knife at one blow. Then the tendon of the one or other of the recti is opened, the muscular tendons fall aside, the posterior layer of the tendon is nipped up by two pairs of forceps and divided between them. The extra-peritoneal fat is treated similarly, the peritoneum raised again by two pairs of forceps, a slight notch being made between them. The moment this is effected air enters and all behind falls away. No director is required, nothing but an observant pair of eyes, lightly applied forceps, and a delicately applied, sharp-cutting knife. The finger is then introduced into the peritoneal cavity, and the relations of the uterus and bladder exactly ascertained. The peritoneum is then opened to the full extent of the 4-inch incision, and the cut edges of the peritoneum are seized on each side by a pair of forceps and are pulled severally to the respective sides. No better retractors can be employed.

"The piece of India-rubber drainage-tube, about 18 inches or 2 feet long, is now held as a loop between the fore and middle fingers of the left hand, and is by that means slipped up over the uterus and pulled down over the cervix, passing the fingers behind the cervix to see that coils of intestine are not included in it. One hitch is then made on the tubing when it has been got as far down as possible, and it is pulled as tight as is consistent with safety. The second hitch may be made in it, but, what is far better, an assistant keeps the tube on the strain, so that one hitch will be quite enough to effect the most efficient clamping.

"A small hole is then made in the uterus, just large enough to admit the finger; if it is possible, the position of the placenta may then be ascertained; if not, the right forefinger follows its colleague, and between the two, by gentle rending, an aperture is made in the uterus and the leg of the child is seized. The fœtus is then carefully delivered feet first, and this, despite all the authorities to the contrary, is by far the best proceeding; less blood is lost, and it requires but very gentle manipulation to relieve the head.

"As soon as the fœtus is removed the placenta is sought for

and removed similarly; the uterus itself, being completely contracted by this time, is pulled out of the wound, and the elastic ligature is tightened once more, and finally arranged round the cervix, and the second hitch is applied. The main details of the operation are now completed; all that is required is to pass the needles through the flattened tube and through the uterus and out at the other side, forming a St. Anthony cross, or two parallel bars to support the weight of the uterus and the stump and to keep it outside the wound. A complete toilet of the peritoneum is then made, not forgetting the anterior vesical *cul-de-sac*; stitches are passed in the ordinary way to close the wound accurately round the uterine stump.

“The uterus is now removed close down to the needles and strangulating rubber tube, so as to leave a little tissue above. It does not do to run any risk of the ligature slipping off, though this is hardly possible after the needles have been placed carefully through the structure of the tube. A little perchloride of iron is then rubbed gently over the surface of the stump; it is dressed with dry lint and some dry cotton gauze, an ordinary obstetric wrapper is put on, and the operation is at an end.”

Hertsch⁹⁵_{B.37,H.3} states that twenty-two Cæsarian sections have been done at Leipzig after Säger's method, with but one death,—seven within less than a year. In only 3 of these cases, as far as known, did a subsequent pregnancy occur; 2 of them were delivered by artificial abortion, 1 by a second section. The latter patient was first operated June, 1887, and again December, 1888. The second operation was complicated by the fact that the uterus and loops of intestines were adherent to the abdominal wall, and that a partial ventral hernia had developed at the site of the abdominal incision, the fundus uteri lying forward between the thighs. The uterine incision was made through the fundus. A chromic catgut suture was encountered, which had become firmly encysted, no absorption having taken place. Silk was used for the deep, and juniper catgut for the continuous, peritoneal suture. The woman was sterilized at her own request by ligation of the tubes. The case is the fourth in the literature of Cæsarian section in which the operation with uterine suture was repeated upon the same woman. Chromic catgut, in the Leipzig experience, seems to justify what Leopold had claimed for it. The juniper gut

appears to satisfy in still greater degree the requirements of a good suture in point of ductility and absorbability. That it may be made perfectly aseptic both their clinical results and bacteriological tests had abundantly proven.

Martin,²³_{Nov.} in discussing the operation and its clinical results, comes to the following conclusions: (1) In all cases of pregnancy in which there is pelvic disproportion, the case should be carefully watched with the view of possible production of artificial labor and the delivery of a viable fœtus; (2) both the Säger and the Porro-Müller operations should be esteemed of primary importance among modern operations; (3) in cases of contracted pelvis, in which operative procedures are indicated, the Cæsarian operation should be preferred to embryotomy, as it is more humane and offers better results both for mother and child; (4) the Cæsarian operation should be performed after dilatation of the cervix and prior to rupture of the amniotic sac; (5) aseptic methods should be carefully observed in all Cæsarian operations. A statistical table published with this paper shows that 70 per cent. of the improved Cæsarian operations have resulted successfully.

J. Halliday Croom³⁶_{Apr.} considers Porro's operation the operation of the future. "One very great reason in favor of the procedure is its simplicity; the majority of physicians can perform it, or ought to be able to, and with appliances that are always at hand, or to be had, 'whereas Säger's modification of Cæsarian section is an operation not adapted to, nor by any means of easy performance by, the general practitioner.' There is another more weighty reason still. What moral or legal right has the physician to take the life of a human being deliberately? I fear we do not justly realize the fearful responsibility assumed, at the time or afterward, but hide ourselves under the cloak of professional privileges and age-long custom; but ere many years have come and gone I foresee that a very strong term will be applied to designate the man and physician who will so far forget, or fail to realize, his legal or moral position as to deliberately take the life of a human being by performing craniotomy."

F. Baldwin²²_{Aug. 9} publishes the history of a successful Porro-Cæsarian section in the case of a typically rachitic dwarf. The pelvis was greatly contracted, with an antero-posterior diameter of about $1\frac{1}{4}$ inches. The patient was 24 years old, weight 100

pounds, height $47\frac{1}{2}$ inches, and was seen one week before term. It was decided to operate as soon as labor began. The operation was commenced when the os was dilated to about the size of a twenty-five-cent piece. The method of Tait was followed. The abdominal incision was just long enough to introduce the hand. A small incision was made in the uterus and enlarged by the two index fingers to the full extent of the abdominal incision. A leg of the child was grasped and it was thus delivered. The cord was at the same time seized with compression forceps and cut. The placenta was then extracted through the wound, the uterus lifted out of the abdomen, the rubber tube tightened and secured by a second hitch, the cervix transfixed by knitting-needles in the form of a St. Andrew cross, and the body of the uterus with the ovaries and tubes cut off. Convalescence was prompt and unmarked by any special occurrence. Lactation was normal. The child was a female, and weighed at birth $7\frac{1}{2}$ pounds. The writer attributes the fortunate result in this case to the promptness with which operative procedures were instituted.

W. Cadge ²_{July 17} reports a case similar to the above. The patient was a rachitic dwarf $46\frac{1}{2}$ inches tall, with a hydrocephalic head 24 inches in diameter. The antero-posterior diameter of the pelvis was $1\frac{1}{2}$ inches. The fœtus was extracted by the head. The uterus and its appendages were removed. The child was cyanosed at birth, though it cried well and seemed to recover; but the breathing did not become normal, the cyanosis increased, and it died four hours after birth.

Halford Walker, of Toronto, ²³_{Dec.} also reports a case in which he performed a Porro operation upon a woman of 36, in a shanty, and without any antiseptic conveniences. The room was 7 by 13 feet in size, and contained two double beds. In spite of the unfavorable surroundings the patient recovered. The child, which was born alive, died shortly, there being no one to take charge of it.

R. P. Harris, ²_{Jan. 11} published a chronological review of the results of the Porro-Cæsarian operation in all countries, from its introduction to the close of 1888. The great value of this work is clearly demonstrated by the fact shown therefrom, that in all countries, with the exception of France, in which there have been twelve or more operations, there can be exhibited a growing improvement

in the results attained. Thus, there were six deaths following the first seven Italian operations, and only seven deaths after the last thirty. Italy saved 20 out of her first 46 cases, and 27 out of the next 45. Austria saved 17 out of her first 30 cases, and 25 out of the balance; her second, 30. Following her last twenty operations there were but two deaths, or 10 per cent. The early record of Germany was so discouraging that out of it grew the Säger-Cæsarian method and its modifications. The first 7 cases were all fatal, and but 6 recovered out of 22, or the first half of all those in her credit. Of the second 22 there were 17 recovered; and of the last 15 only 2 died from the operation, a third death having been suicidal. England lost 7 out of her first 8 cases, and then saved 2 in succession. Mr. Tait claims to have had three additional operations without a death, but has not reported the cases; which would enlarge the credit of England to 15, and her recoveries to 8. This would have been a very remarkable success in the early days of the operation, but is much less so now. The late Professor Breisky performed his first operation in Prague on July 9, 1878, and his eighth and last in Vienna on September 28, 1888. Not one of his eight operations, covering more than ten years, had a fatal termination, and all of the children were living. Hubert Riedinger, of Brünn, also aided in a remarkable manner in establishing the credit of Austria. His first operation preceded that of Professor Breisky by twelve days, and his seventh was nine days before the eighth of Breisky. The seven women recovered, and but one child was lost. Up to the last of December he had not performed an eighth operation. France, as already mentioned, has not improved her record by experience. On the contrary, she has retrograded. The first five operations saved three women and three children; the second five, one woman and five children; the third, one woman and two children, and the two additional saved one woman and two children. There has not been reported one French Porro case belonging to the past four years, and the operation would appear to have been abandoned by its early advocates.

Seventeen operations belonging to the last four years, ending on December 31, 1889, have been reported to Harris in answer to letters, of which 4 terminated fatally. The records of these four years are, respectively, as follow: 1885—24 cases, 7 deaths;

1886—23 cases, 4 deaths; 1887—18 cases, 5 deaths, 1 suicide; 1888—28 cases, 4 deaths. Of the first 50 women out of the 264 cases recorded 30 died as the result of the operation, and of the last 50 but 10,—a reduction of the death-rate from 60 per cent. down to 20.

Of the whole 264 women 117 died from the operation, divided as follows: 74 out of the first half; that is, 132, and 43 out of the second 132. Thus it will be seen, under several forms of calculation, that the Porro operation of to-day, under proper management, is far less fatal than that of five years ago, as in 1884, when 17 women died out of 29, or nearly 58 per cent.

As the day of experiment has passed and the technique of the operation has been established by experience, there is no reason why there should not be a large percentage of cases saved,—certainly 80 per cent.,—and, with due care as to time of operating and condition of strength in the patient, even more than this. The operator ought to be able to make a prospective prognosis in a given case, and should, if possible, so order the preliminary steps that “unfavorable” will not have to be written in rating the prospects of the patient. It is a well-established fact that few cases rated as “favorable” before the operation have died, and that still fewer marked as “unfavorable” have not. The respective credits of the several countries in which the Porro operation has been performed (not including that of 1889) stand as follows:—

No.	Country.	Cases.	Saved.	Lost.
1	Italy.	91	47	44
2	Austria.	60	42	18
3	Germany.	44	23	20*
4	France.	17	6	11
5	England	12	5	7
6	Russia.	10	8	2
7	United States of America	8	2	6
8	Belgium	5	3	2
9	Scotland	5	1	4
10	Switzerland	6	5	1
11	Australia.	2	2	0
12	Holland	1	1	0
13	Spain	1	0	1
14	Mexico.	1	0	1
15	Japan	1	1	0

* And 1 suicide.

It is proper, in this connection, to state the results of the conservative Cæsarian section up to the same date, January 1,

1889, as many may be under the impression that the Porro operation is quite equal to it in its ability to save life. Like the latter, the new method of performing the old Cæsarian section is also passing through a stage of diminishing mortality, and there is a very marked contrast for the better between the work recently done and that of the years 1882, 1883, 1884, and 1885; and particularly is this the case in the United States of America. Out of the first 20 cases operated upon in all countries, there were 9 deaths; out of the second 20, there were 6; and out of the last 40, in 1888, there were only 6. The following table will show the operations in contrast:—

No.	Country.	Cases.	Saved.	Lost.
1	Germany.	94	81	13
2	Austria	32	26	6
3	United States of America.	26	11	15
4	Russia.	10	7	3
5	France.	4	2	2
6	Italy.	4	2	2
7	Holland.	9	9	0
8	England.	3	1	2
9	India.	2	1	1
10	Switzerland	2	1	1
11	Denmark.	1	1	0
12	Norway	1	1	0

There were 57 operations in Europe in the year 1888, with 7 deaths; and 13 in the United States of America, with 8 deaths. There have been 34 operations in America, with 18 deaths.

Arthur Macan^{16 Nov.} publishes a case of Cæsarian section which he performed at the Rotunda Hospital, and adds that it is the only successful recorded case in Ireland. The patient was aged 20, and only measured 3 feet 7½ inches high; she was admitted on July 9, 1889, two weeks before her confinement was due. The author decided to perform Cæsarian section, as soon as labor had advanced toward the end of the first stage, just when the os is nearly fully dilated and the membranes unruptured. The reason for waiting so long is, in order that the lochia may be able to drain away through the cervix during the puerperal state. At 8.30 A.M., on August 5, the os had commenced dilating, and the vagina was well disinfected with 1-in-5000 solution of corrosive sublimate. At 10.30 A.M. an incision was made in the abdominal wall from the umbilicus to within 2 inches of the pubes; but this had to

be extended upward, to enable the uterus to be turned out. A strong elastic ligature was now put twice round the cervix of the uterus, drawn tight, and then fastened with large compression forceps. The uterine wall was then freely incised in the middle line between the fundus and the cervix. When the membranes came into view they were at once ruptured, and the child extracted without difficulty; but, though the time from the application of the elastic ligature to the extraction of the child could scarcely have been two minutes, the child was in a state of blue asphyxia. The cord was at once tied and cut, and the child soon cried lustily after applying artificial respiration. Its weight was $7\frac{1}{4}$ pounds. After peeling off the placenta and membranes and disinfecting the interior of the uterus, the edges of the uterine wound were carefully brought together by silk sutures, introduced 1 centimetre from the edge of the uterine wound, through the muscle and decidua, emerging through the latter about $\frac{1}{2}$ or $\frac{3}{4}$ of a centimetre from edge of wound, and continued through the opposite side of the wound in like manner. Sixteen stitches were thus passed and tied tightly, and the elastic ligature was then removed. The uterus contracted badly and some oozing of blood took place, which was stopped by passing an additional suture, and applying hot sponges to the uterus and kneading. The abdominal walls were then closed by 16 stitches, and the usual Lister dressings were applied. The patient made a good recovery, and union was perfect by the twelfth day.

Two fatal cases are reported by Vinke, of St. Charles, Mo., ⁴⁰Mar. both Säger operations, without the removal of any part of the muscular wall of the uterus. He is convinced that morphine is always contra-indicated after grave operations, as it has a tendency to lower the vitality, particularly so after abdominal sections.

PUERPERAL DISEASES.

By WALTER P. MANTON, M.D.,

DETROIT.

Parvin ⁷⁶⁰_{Apr.12} has formulated some excellent rules, after the manner of the Mosaic law, for the guidance of puerperal patients. These say: Thou shalt not get up when there is a red flow; thou shalt not sit up before two weeks; thou shalt not work before three weeks; thou shalt not go out of the house before six weeks.

PUERPERAL PYREXIA.

Hausen ³⁷³_{B.S.Nos.6,7} has made nearly 800 temperature examinations in Stadfeldt's clinic, in Copenhagen, to determine the prognostic importance of, and the influence of treatment on, high temperatures in parturient women. Of 362 parturients, 315 had normal temperature; in 47 it was 38° C. (100.4° F.) or over, but in 7 of these the fever was due to complications having no connection whatever with the labor. Of the 315 having normal temperature, 39, or 12.4 per cent., subsequently manifested symptoms of septic infection; while, in the case of the 40 having rise of temperature, infection developed in 24, or 60 per cent. The prognosis is, therefore, less favorable where the temperature is raised during labor. In 121 women whose temperature was taken after the birth of the placenta, it was found normal in 98 and elevated in 23, the puerperal morbidity of the former being 11.20 per cent. and of the latter 56 per cent. Here, also, the prognosis is less favorable with rise of temperature; but it is not so serious as Temesvary and Bächer have indicated. The cause of pathological rise in temperature during and following labor is stated by Hausen to be septic infection of a more or less ephemeral character, and he does not believe that other conditions, such as the act of labor and psychic influences, participate in producing this effect. Cameron, ³⁹_{Oct.1} on the other hand, states six sources of high temperature in childbed: mild infection, dormant tendencies roused to activity,—as exacer-

(K-1)

bation of phthisis, etc.,—cystitis or skin affections, emotional or psychological disturbance, cold, and reflex irritation.

INFECTION.

Greenley⁶¹_{Aug. 9} revives the theory of Barker and others,—that there is an idiopathic puerperal fever manifested in inflammation of the womb and adjacent structures,—and thinks that it is a dangerous doctrine to proclaim that the condition is entirely due to heterogeneous septic matter, and is a preventable disease. While in most cases the cause may originate outside the body, there is an “old” form, due to pathological processes, within the organism.

Pedley⁶_{Dec. 21, 189} calls attention to the possibility of puerperal women being infected by the breath of the physician, nurse, or midwife. Matter from carious teeth, alveolar abscess, necrosed bone, etc., may be carried from the mouth to the parturient canal. A curious source of infection is pointed out by Eddington¹⁹⁹_{July}: Physicians who milk their own cows, the teats of which, he says, are always foul and unclean, may carry the filth and scales adhering to the hands to a parturient woman, with the result of infecting her. Thomas²³_{Mar.} shows that the water-closet is a source of infection during labor. The patient sitting over the bowl while the vulva and vagina are rolled out and swollen, the parts are bathed with the foul emanations from the closet, and infection is insured.

Prevention of Infection.—Thomen⁹⁵_{B. 36, H. 2} has carefully investigated the vagina and cervix in pregnant women, and has failed to find staphylococci or pathological streptococci. He agrees with Döderlein that the vagina of the lying-in woman under normal conditions contains numberless germs of various kinds, and that these are more abundant in the vicinity of the introitus than in the upper vaginal third. The number of micro-organisms in the vagina is decidedly greater during the first day of puerpery than immediately following labor. In 2 cases, lochia taken from the cervix was sterile; in 1 it contained an occasional germ; in 2 the micro-organisms were few, and in 1 plentiful. Lochia from the cavum uteri was sterile in 4 cases; in 3 it contained a variety of micro-organisms, among these streptococci twice. Hégar,⁴⁰⁴_{No. 351} finding that the death-rate from puerperal disease has not been materially affected in Baden since the introduction of antiseptics, discovered the reason in the unwarranted confidence placed in them,

too frequent digital examination, and carelessness on the part of midwives in regard to cleanliness of syringe-nozzles, etc. He would, therefore, have midwives prohibited from making digital examinations, believing that if sufficiently trained in abdominal palpation, the requisite information in regard to position and progress of labor may be as well obtained in that way. Leopold and Pantzer⁹⁵_{B.38,11.2} very pertinently remark that the sense of cleanliness is as much inborn and less to be acquired by cultivation than music, art, or technical skill. With Hégear they are of the opinion that abdominal palpation should be more carefully taught; and, as nearly all that is necessary to know regarding presentation and progress can be determined by outside manipulations, vaginal examinations should become less frequent. In a valuable contribution on the subject of abdominal palpation in pregnancy, which was read before a branch meeting of the British Medical Association, Spencer⁶⁴⁵_{Jan} refers to the scant mention given to this in the standard text-books, and points out its importance from a scientific and practical point of view. As a prophylactic measure, Péraire⁴⁴_{July} advises that women, from the beginning of gestation, shall use a mild biniodide douche twice a day, the vulva to be washed with soap and water and a borated or salolized pad placed over the parts. Before digital examination, not only should the accoucheur observe the strictest precautions regarding his hands, but the vagina must be douched and the vulva washed with biniodide-of-mercury lotion (1 to 2000). Following delivery, if no operative interference has been necessary, an antiseptic douche is given, and during the puerperium a hot douche twice a day, a pad of iodoform or salol gauze being kept over the vulva. In cases of infection, vaginal and intra-uterine douches are given and the patient washed night and morning in borated water. If there is no improvement within twenty-four hours the curette should be used.

Glöckner and Keller⁶⁹_{No.32} have undertaken two series of experiments with reference to the necessity of antiseptic douches. All the patients were bathed before labor, and the external genitals washed with soap and warm water and then with a 1-per-cent. bichloride lotion. In the first series of cases the vagina was douched with 1 to 1½ litres (1 to 1½ quarts) of water; in the second series it was omitted. In the first series of 312, 88.4 per cent. remained absolutely fever-free and 94 per cent. had no fever or only a slight

evening rise. Fever appeared in the evening more than once in 2.98 per cent.; morning and evening fever, over 38° C. (100.4° F.) in 2.98 per cent. In this series there was no serious puerperal disease developed. In the second series of 120 cases, 94.10 per cent. remained fever-free and in 99.16 per cent. there was no fever, or only a slight evening elevation of temperature. Fever appeared more than one evening in 0.83 per cent.; fever morning and evening there was none; and there was also no serious puerperal sickness. The reason for the greater morbidity in the first series may have been due to the fact that the greater part of these cases were examined as far up as the contraction-ring for other purposes. The inference to be drawn from these experiments is that in healthy lying-in women the rigorous antiseptic internal measures, as advocated by Steffek and others, are quite unnecessary. Peters²⁶_{Apr.} reports a fatal case resulting from prophylactic douches of a weak sublimate solution. After using this for a week or two peritonitis developed, abortion followed, and the patient died.

Mermann,³¹⁷_{No.15} who last year reported 200 labors conducted without antiseptic precautions, adds another 200 to the list. Of this number there were no deaths and but 12.6 per cent. had a temperature of 38° C. (100.4° F.) or over. Axmann¹⁰⁴⁸₈₉ states that, after an experience of thirty years as director of a lying-in institution, he has arrived at the conclusion that cleanliness, rest, non-meddling are the right disinfectants, and he deprecates the use of all chemicals in healthy pregnant and lying-in women.

Treatment.—McBeath⁶_{Nov.22} has used antipyrin in puerperal septic infection with success, and considers it not only an antipyretic but also an antiseptic. In one case recorded the patient took eighteen powders of 10 grains (0.65 gramme) each within a period of two days and a quarter. That this drug is not wholly free from danger or unpleasant results has been pointed out in an editorial⁶¹_{Sept.6} on the anilids in childbed. The experiments of Pinzani⁴⁷²_{V.23,p.6} also show that antipyrin given in childbed weakens the action of the uterus. Shildkret⁵⁷¹_{No.13; June}²⁰⁰ strongly recommends salol in puerperal febrile affections. After a thorough cleaning out of the intestinal canal by calomel, 10 grains (0.65 gramme) of salol are given every hour for twelve to fifteen hours and subsequently three or four times a day. In cases where the lochia becomes offensive, besides the usual general and local treatment employed, the vagina

should be frequently washed out with a salol solution (a teaspoonful of the saturated solution of the drug in alcohol to a glass of water). Of 20 cases treated in this manner but 1 died.

Gusbeth¹¹³_{Oct.19, '89} reports a case of septic infection which was considered almost hopeless, as treated by the Kurz method of continued uterine irrigation, with brilliant results.

Curettement is objected to by Collins⁶_{Jan.19} in all cases except for removal of putrefying portions of the placenta or membranes. In sapræmia it can do no good, but may become a source of actual danger by creating a fresh breach of surface for absorption. In such instances irrigation is indicated to wash away the ptomaine-producing germ. In septic infection neither douche nor curette are indicated, as the germs themselves have penetrated into the tissues and produce a constitutional fever in which the local organs may be but slightly implicated. Leopold³¹⁷_{No.11} considers that baths, which have been highly recommended in the treatment of puerperal sepsis, are but of doubtful service. In a case of retained and rotting placenta, the patient suffering from septic infection, Roosenburg⁵⁸³_{No.21, '99} removed the entire uterus per vaginam. Tampons of iodoform gauze and cotton dipped in iodoform glycerin were packed into the vagina. The patient made a good recovery. Stahl¹_{Aug.30} reports a case of supra-vaginal hysterectomy, with extra-peritoneal treatment of the stump, for septic infection due to retained membranes. Curetting and douching had failed to meet the indications.

PUERPERAL ENDOMETRITIS.

E. von Braun-Fernwald⁹⁵_{B.37, H.3} states that in 7600 births there were 101 cases of sapræmic endometritis treated by the curette. Of this number, 5 of the women died,—a mortality of $4\frac{8}{10}$ per cent. Hæmorrhage following excochleation is rare; it occurred but once. After the scraping, the uterus is washed out with a 1-to-1000 thymol solution, pressure being made by the hand from above to promote expulsion of the fluid and contract the uterus. A finger-thick pencil of iodoform dipped in tincture iodine is then carried to the fundus uteri, all abrasions are treated with tincture iodine, and the cervix and vagina are packed with iodoform gauze. The patient is then put to bed, given plenty of cognac, and an ice-bag placed on the abdomen. The tampon is removed in twenty-four hours, and the vagina douched daily with thymol lotion. The

curettement is done without an anæsthetic, as it is not particularly painful. As indications for excochleation, Braun mentions (*a*) fever during the early days of childbed; (*b*) imperfect involution of the puerperal uterus; (*c*) abnormal lochia, discolored, bad-smelling secretion, often containing shreds of tissue.

PELVIC PERITONITIS.

Waterhouse²⁰_{B.119,H.2} has made some experimental investigations in regard to the etiology of peritonitis, choosing rabbits as test animals, and the staphylococcus pyogenes aureus and streptococcus pyogenes for micro-organisms. His repetition of Grawitz's test,—the introduction of a large quantity of staphylococci aureus in distilled water into the abdominal cavity of various animals,—corroborated the latter's statement that peritonitis did not result. Negative results were also obtained after the introduction of fresh urine and small quantities of blood with cocci. Large quantities of fresh blood, and especially blood-clots, produce a fatal peritonitis which may be very rapid. When large quantities of micro-organisms are brought into contact with a wound, or the wound is irritated, as with oil of turpentine, colonies of micro-organisms may be established. The healthy peritoneum offers a strong resistance to the invasion of organisms from without; and the intestine is also impervious to organisms as long as it is not necrotic. The prevention of absorption and excretion of injected micro-organisms and the injury to the tissues by the consequent hyperæmia of stasis leads to suppuration; while the same number of micro-organisms taken into healthy tissues would be eliminated without reaction. Fraenkel³⁴_{Jan.14} concludes, from an examination of 15 cases of exudative peritonitis, that, as micro-organisms are always found in this condition, it is therefore a true mycotic affection. The micro-organisms playing the most important rôle are the chain-cocci, of which the most frequently met with is a streptococcus. Predöhl³⁴_{Jan.14} who has investigated 14 cases of peritonitis, differs from Bumm, in the opinion that puerperal peritonitis is always a streptococcus peritonitis, although this organism may have an important bearing in its etiology.

Pelvic Peritonitis Without Fever.—Corresponding Editor Manasseh, of Beyrouth, reports 3 cases of this condition in which the disease ran its course without fever. Sixty days post-partum

a woman in whom the discharge of blood still continued was suddenly seized with severe abdominal pain, which continued for a few hours and then ceased, to return with greater violence next day. This was associated with vomiting and a feeling of weight in the pelvic region. The pulse was small and rapid, varying from 118 to 140. The symptoms continued for ten days, the abdomen becoming more and more tympanitic and painful. Vaginal examination revealed a mass at left of uterus, and a diagnosis of subperitoneal hæmatocele followed by peritonitis was made. The temperature never ran above 99° F. (37.2° C.). The patient finally had a sharp attack of diarrhœa with a discharge of pus. Watson⁶_{Dec. 21, '89} saw peritonitis develop in 2 successive lyings-in from syringing the vagina. It is supposed that there was a patulous left Fallopian tube, through which some of the fluid found its way to the peritoneal cavity. Hamilton⁸⁰¹_{July} reports a case of peritonitis occurring the day following delivery, which he ascribes to exhaustion caused by moving the patient from bed to couch and back again.

Treatment.—Johnston¹⁸⁵_{Dec., '89} treated a case of septic peritonitis, in which other remedies had proved unsuccessful, with repeated doses of salines—Seidlitz powder and Epsom salts—until the bowels moved freely. The patient recovered. Schabbel³¹⁷_{No. 16} has found mercury, in small, repeated doses, of advantage in the treatment of mild peri-uterine inflammations. If the bowels become too loose, the inunction of from 2 to 8 grammes (30 grains to 2 drachms) of unguentum cinereum is substituted, and the treatment continued until stomatitis results. Raymond¹⁰⁰_{Aug. 23} relates a case in which a violent chill, followed by fever, resulted on the third day post-partum. The symptoms were relieved by intra-uterine douche. Nine months later the patient appeared with abdomen distended, great pain, diarrhœa, and symptoms of suppuration. By laparotomy 4 litres (quarts) of pus were evacuated. Raymondeau²⁶_{Oct.} reports a similar case in which the abdomen was opened on the sixteenth day after delivery. Evans⁵⁹_{Apr. 12} opened the abdomen for purulent peritonitis following abortion and evacuated pus, reopening of the abdominal wound being necessitated by the formation of an abscess three days after operation. Bouilly²³⁶_{Dec., '89} recommends a short abdominal incision in this operation, and irrigation by means of a fountain-syringe with glass douche-tube. The

fingers are first carried in among the intestines and then the cavity flushed with 8 to 10 quarts (litres) of hot water. If desired, a 1-to-10,000 bichloride solution may be used. A large drainage-tube is then inserted and antiseptic dressing applied.

PUERPERAL SCARLATINA.

Renvers⁸²_{Oct.11} calls attention to the fact that scarlatina is not, in all instances, responsible for the scarlatiniform exantheams occurring during the puerperal period, and cites 3 cases where the rash was due to septic infection. A differential diagnosis of the two conditions is important with reference to the treatment. He considers it best, in every case where diseased conditions of the genital tract are of a serious nature, to regard the rash as of toxic origin. Koller,²_{July 26} in his thesis on the subject, concludes that scarlatina is a rare complication during the puerperium. Adam²_{Apr.5} thinks that the proximity of a scarlatinal case to a puerperal woman gravely alters the prognosis for the latter. On the other hand, Stawell,²_{May 10} reports a case which was exposed to the scarlatinal poison, but failed to take the disease; while Wilson²_{Apr.5} cites cases where women were delivered in the same bed or room with scarlet-fever patients and did not in the least suffer from the exposure. Such tests would seem to militate against the idea of Garrett, Myrtle, and Harris,²_{Mar.29} who believe that puerperal women are particularly susceptible to the poison.

PUERPERAL FEBRILE DISORDERS.

Malaria.—Krusenstern^{729: 132}_{Feb.} states that malarial fever generally, and in its remittent form in particular, does not retard the post-partum involution of the uterus. In cases where women have suffered from malarial fever the uterus has decreased in size, as in normal cases. He is of the opinion that subinvolution in malarial puerperæ is the result of intercurrent endometritis, and is not due to the malarial poison itself.

Rheumatism.—Smith²⁷_{May} reports a fatal case of this somewhat rare disease. The patient had suffered from symptoms of rheumatism during the last two months of gestation, and during labor complained of pains in the upper extremities. Six days post-partum, rheumatism developed in right elbow, the symptoms disappearing under salicylate of soda. A week later there was a

severe attack of pleurodynia, followed, in four days, by rheumatism in the left knee. There was high temperature, sweating, pain, redness, and swelling, but no pus formation. No evidence of septic origin of symptoms discernible in the pelvic organs. The patient died a month and two days post-partum.

Syphilitic Fever.—Leblond¹⁴_{Sept.14} describes the sudden development of high temperature eight days post-partum in a previously healthy (?) woman. The pyrexia was supposed to be due to septic infection, but intra-uterine douches and antipyretics produced no effect. In the evening of the day following a roseola appeared on the breasts and spread to the abdomen and back, remaining two days. The general health and pulse were good. The patient had had a chancre some months previously, followed by roseola and vulvar and buccal plaques.

PUERPERAL PSYCHOSES AND NEUROSES.

Leopold Kramer⁸⁸_{Nos.45,46,89} develops the theory of Fürstner and Hausen that puerperal psychoses are due to septic infection, and adds 9 cases observed by himself. In each of these infection was evident either from the condition of the local organs or from the high temperature. In the beginning there were nearly always hallucinations and illusions, with marked excitability; then melancholia or mania, or both conditions, and always, after a time, return to the normal. There could be determined no relation between the intensity of the infection and the mental disturbance. Kramer believes that these psychoses are of a toxic nature, due to the products of metamorphosis caused by Brieger's ptomaines. In such cases there may be a predisposition, the infection being the etiological moment for its development, or the condition may be directly produced. Wilson²³_{Aug.} believes that in insanity or mania developing during the puerperal period, and in contradistinction to the mania of lactation or antipartal mania, the progress is always more favorable where the insanity assumes the maniacal type,—that is, as regards the life and recovery of reason. The cases which he has seen were associated with more or less distinct septic manifestations. In 1 case of acute puerperal mania seen by Wilson, the patient took 560 grains (37 grammes) of chloral hydrate within a period of three days, and made a good recovery. Worcester²⁷⁸_{July} discusses the question, Is puerperal insanity a distinct

clinical form? He reports 8 cases, and, from his experience at the Little Rock and Michigan Asylums, concludes that there is nothing in the symptoms of patients thus affected that will enable one to say, without a previous knowledge of the history of the case, that a given case is one of puerperal origin or due to other cause. He is, therefore, of the opinion that there is no such thing as a distinct puerperal insanity.

Puerperal Tetanus.—Gautier¹⁹⁷_{No. 12, '89} has made a careful study of 74 cases of this condition, of which 36 followed abortion and 38 confinements at term. It was found that the complications of labor most frequently followed by tetanus were those necessitating the use of intra-uterine tampon and the artificial removal of retained placenta. Fifteen post-mortem examinations were made. In 3 microscopical examination of the brain and cord failed to reveal any appreciable lesion; in the other cases hyperæmia and meningitis were found. In 1 case there was hæmorrhage into the lateral ventricles; in another a retained putrefying placenta was found; in 5 suppurative inflammation of the uterus and appendages was present, and in 1 ovarian cyst. In the treatment of this condition absolute quiet of body and mind is essential. Although a great variety of drugs have been employed, antiseptics, stimulants, and sedatives have been of most service. Chloral hydrate is of the greatest value; 8 grammes (2 drachms) may be given during the first twenty-four hours, increasing or diminishing afterward, according to the effect produced. Peacock⁶_{Aug. 17, '89} reports a case of tetanus occurring on the tenth day post-partum, resulting in death in four days. The delivery had been by forceps, and there was a slight perineal tear. Werzünski⁵_{Mar.} has a somewhat similar case in a primipara, with contracted pelvis delivered by forceps. A slight laceration of the perineum occurred, which was immediately sutured. Headache on fourth day, trismus on fifth, followed by spasms and opisthotonos and death on sixteenth day.

Lusberg, according to Ouchterlony,²²⁴_{Jan. 18} saw 2 cases of tetanus develop on the tenth day post-partum. In 1 there seems to have been direct infection from ptomaine formation in an abscess between the rectum and sacrum. Alexander²⁴_{Sept. 21} records a case occurring ten days after an abortion between the second and third months, and Witthauer³¹⁷_{No. 15} two, the first following manual removal

of a small piece of retained placenta and the suturing of a perineal tear, the second after a chill and symptoms of septic infection.

Puerperal Paralysis.—Bassette²⁴²_{Feb.} describes 2 cases of this rare condition. In 1 the onset of the disease occurred three weeks after a normal labor, and when the patient was in a comfortable condition. There was complete paralysis both as to motion and sensation on the right side, and aphasia. There was no loss of consciousness at any time. The result of treatment of several months' duration was decided improvement in the symptoms. In the second case, which occurred on the eighth day post-partum, the patient was unconscious for several hours, and, on regaining consciousness, was unable to speak or put out her tongue. A week later there was a chill, with paralysis of the right leg and arm. Improvement began in a few weeks.

Puerperal Neuritis.—Möbius³⁴_{No.14} adds another to the list of cases already published by him. The disease affects the arm-nerves, and, as a rule, the terminal branches of either the median or ulnar nerves, or both. The motor as well as the sensory fibres are affected. Often there are severe pains in the arms. After a varying period the disease abates and there is a gradual recovery. In the present case the legs, as well as the arms, were affected, the former being thin and weak, with the calf-muscles exceedingly sensitive to pressure. Tendon reflex in arms, and knee phenomenon active. The flexor tendon of the middle finger was contracted, and appeared as an inflamed and sensitive cord. Both hands were the seat of a burning, prickling sensation, the strength was diminished, and the interosseous muscles atrophied. There was no paralysis, no renal or internal organ complication, no gland swelling. The cranial nerves were not affected. Cases of this nature have also developed in the pernicious vomiting of pregnancy. As a cause, Möbius is inclined to consider septic infection, as there was fever, etc., in his first case; but he also believes that other unknown causes at work in the body may produce the condition.

Hysteria.—Although puerperal hysteria cannot be classed as a rare complication, yet the meagre reference to the condition in current literature would seem to indicate that it is, as a rule, unrecognized by the majority of practitioners, or the symptoms are wrongly attributed to infection or other cause. Broughton⁹⁹_{June 12}

reports 3 interesting cases, in all of which there was a nervous temperament and neurotic tendencies. Many of the symptoms, as pyrexia, etc., pointed to infection, but a careful examination of the pelvic organs and a study of the symptoms as a whole enabled this to be eliminated. In the discussion which followed Broughton's paper, Green mentioned 4 other cases which he had seen. In all these cases the exciting moment for the developing of symptoms seems to have been some mental impression.

POST-PARTUM HÆMORRHAGE.

Piering²⁸³_{No.41, '89} reports 6 cases of post-partum hæmorrhage, treated successfully by Dührssen's method. According to Pinard,⁸¹_{Dec.22, '89; Jan.2} intra-uterine injections of water at 46° to 50° C. (115° to 122° F.) will produce energetic contractions of the uterus and stop the hæmorrhage. Hot water also exercises a decided effect on the uterus during the period of involution, the process being hastened by its use. In the profound anæmia which is seen following post-partum hæmorrhage, Huzarski³¹⁷_{No.28} speaks most favorably of the injection of saline solution. In a case reported the patient suffered from nausea, ringing in the ears, and dizziness; 900 grammes (28 ounces) of saline was injected under the skin between the shoulders by means of a Potain apparatus. The subcutaneous cellular tissue of the nates was also injected. The pulse improved, and all the symptoms disappeared except the nausea, which recurred from time to time. Improvement continued, and the patient was able to leave her bed in about two weeks. Powell⁶⁵_{July} records a case of profuse secondary hæmorrhage occurring seven days post-partum, which required the swabbing out of the uterus with a styptic before it could be controlled. A large bilateral laceration of the cervix with extensive erosions, subinvolution with anteversion and hyperæmia, undoubtedly contributed to produce the condition. In the treatment of hæmorrhage, Dirska⁴_{No.8} recommends pressing the fundus uteri firmly with one hand, while with the other clots are cleared away, and two or three pieces of ice are slipped into the uterus and upper part of the vagina. The ice is allowed to remain for a few minutes, and the uterus compressed for a quarter of an hour or more. Of 30 cases of placenta prævia centralis, in which this method was employed, all were saved. Heer¹⁹⁷_{July} indorses the rectal injection of

saline solution in the acute anæmia from post-partum hæmorrhage. The fluid is quickly absorbed, and the method has the advantage over transfusion in that it requires no special apparatus and can be employed by any one.

THE PUERPERAL BREAST.

Inability to Suckle.—Mensinga⁵⁷_{Jan. 15} considers that inability to suckle is dependent upon three conditions,—defective milk-gland, vasa lactifera, or nipples. In nearly all of these conditions centripetal or centrifugal stroking of the breast, with proper attention to the diet and hygiene of the patient, will result in milk secretion and ability to nurse. Treatment should be inaugurated after the twentieth week of pregnancy, and carried out as often as once a week until delivery. Even in puerpery, gentle massage and stroking, principally the latter, will result in great improvement in the galactiferous function.

Anomalous Secretion.—Landau⁶⁹_{No. 33} reports the secretion of milk in the breasts of a woman more than a year after the removal of the ovaries. In another case the milk from one breast was sweet, while that from the opposite gland had a salty flavor. A woman 31 years old had a discharge of blood from the nipples every four weeks. A case somewhat similar is reported by Habergritz.⁸⁴_{July 26} From the breasts of the patient, a I-para in the sixth month of pregnancy, drops of blood could be pressed. Two days before delivery the blood disappeared, to be again secreted in increasing quantity after labor. There was no blood-taint or organic disease present to account for the condition, which Habergritz suggests may have been transuded blood, which was intended later to form the colostrum and milk. Under diet and secalè the secretion finally lost its blood color and became blue-white. The mother nursed the child and both did well.

Morphia in Milk.—Pinzani³¹⁷_{No. 36} gave 12 nursing women, for one or more days, 3 to 5 centigrammes ($\frac{7}{19}$ to $\frac{4}{5}$ grain) of morphia hydrochlorate a day. These women nursed thirty children. The test was also made with Sydenham's laudanum, and was negative in both instances,—the children remaining unaffected. Chemical test of the milk by Pellagri's method also failed to reveal the presence of the alkaloid. It was therefore concluded that small therapeutic doses of morphia do not go over into the milk.

If the alkaloid is changed in the body into oxymorpha, the presence of this in the milk would be quite harmless. This investigator<sup>172
v.23</sup> also finds that the children of wet-nurses to whom antipyrin is given suffer from colicky pains and diarrhœa, the drug going over into the milk in small amounts. The nursling remains well, however, and there is no quantitative change in the milk.

Mastitis.—Deis,<sup>317
No.3</sup> following the scheme of Kehrer, distinguishes two varieties of mastitis,—one, an interstitial form, which affects the subcutaneous connective tissue surrounding the gland and usually goes on to abscess formation; the other, a parenchymatous variety, beginning in and affecting the milk-ducts and glands themselves. The latter he ascribes to an infection of the parenchyma by organisms which penetrate the milk-ducts. These produce, on the one hand, an inflammation of the walls of the canals, and, on the other, decompose the milk. The caseine is deposited, and the lactic and butyric acids which are formed also produce irritation of the parenchymatous epithelium. Deis concludes that 3.6 per cent. of puerperæ, especially I-paræ, suffer from this disease; that in about half of the cases the condition is preceded by excoriation of the nipple; that the inflammation generally appears on the fifth, ninth, or tenth days of the puerperium, and lasts, on an average, five days. The external and lower external lobes of the breast are oftenest affected; the fever is of short duration, the maximum temperature occurring on the first day of the disease. When pus is formed it can be pressed out through the nipple on first or second days, and remains but a short time. Duke,<sup>2
July 5</sup> has devised an ingenious spiral spring support to take the place of the bandage in cases of mastitis. Besides equalizing the pressure, such an arrangement is cooler, and allows applications of salves, etc., to be made under the spiral.

DISEASES OF THE NEWBORN.

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SEPTIC MICRO-ORGANISMS AND THEIR INFLUENCE.

IN view of the well-nigh universal distribution of micro-organisms, it is not remarkable that their existence should be demonstrated in or upon the newborn. The investigations of Cholmogorow³⁶⁶_{Mar. 8} in this direction were made at the Moscow Foundling Asylum, and at a time when there was no epidemic of puerperal fever in the hospital. The children who formed the subjects of study were healthy, were without conjunctivitis, and their mothers had experienced a normal parturition. In five cases, portions of Wharton's jelly and of the substance of the vessels in the stump of the navel-cord were removed with the strictest antiseptic precautions, and cultures were made in agar-agar, gelatin, and bouillon. No micro-organisms were obtained in either case. Other experiments were made to ascertain the influence of the various methods of protecting the stump of the cord upon the development of micro-organisms. The result of these was the discovery of numerous varieties of microbes which were believed to come from without. The pathogenic varieties were the same as are found in purulent infection. Of the different methods of protecting the stump, it was found that when it was covered with a plaster bandage there was slight tendency to the development of microbes, the tissue drying quickly, and a healthy base being left when it separated from the body. In 2 cases of pyæmia in newborn infants, reported by Baginsky,²⁰_{B. 90, H. 3} infection occurred in 1, through the umbilical cord, which was in a condition of purulent inflammation. There was also inflammation with œdematous infiltration of the extremities. The liquid obtained from the cord contained numerous chain micrococci. In the kidneys they were so abundant that they had caused necrosis of the tissue. In the radio-carpal articulation there were strep-

tococci, which on cultivation were found to be specimens of streptococcus pyogenes. In the second case, infection had taken place through inflammatory lesions of the skin. Many streptococci were found in the kidneys and spleen. The author called attention to the close relation which exists between puerperal affections and suppuration or erysipelas of the newborn. In this connection, Henrique de Sà ³⁶⁶_{Mar. 8} reports a case of erysipelas in an infant 6 days old, infection having taken place through the navel.

That abscess of the breast in the newborn is by no means infrequent was shown at a recent meeting of the Medical and Surgical Society of Baltimore, when Bressier ¹⁰⁴_{June 14} reported a case which was followed by pyæmia. Two other cases of abscess were reported at the same meeting by Street. The pernicious habit of squeezing the breasts, practiced by some nurses, was referred to, and physicians were urged to caution nurses against such practice. These abscesses are sometimes seen in connection with the secretion of a milk-like fluid, which has frequently been observed. Tarnier has referred to such a secretion as physiological. Séjournet ⁵⁷⁷_{July} saw 8 cases of this character during the first six months of this year. The breasts were hard and swollen, the enlargement appearing on the third or fourth day of life. Mild pressure was sufficient to expel the fluid, which contained butter, caseine, and sugar of milk, the same as any lacteal secretion. Kölliker has also found in this secretion degenerated epithelial cells. Séjournet advises that this fluid be removed by mild pressure daily, and that the breasts be rubbed twice a day with borated vaseline, a cotton compress being then adjusted. He also warns of the danger of producing an abscess if force be used in the manipulation, or if the fingers of the nurse or physician are not clean. Cases of this character are also reported by Hirst ⁷⁶⁰_{Dec. 14, '95} and by Variot, ³_{July 30} and the latter calls attention to the fact that the phenomenon may be seen in infants in whom there is cachexia or extreme emaciation.

A case of suppurative parotitis is reported by Briquet, ²²⁰_{Feb. 14} which resulted fatally in about two weeks. Cultivation of the pus showed the presence of staphylococcus pyogenes aureus et albus. This case is one of extreme rarity, and the author was able to give no information in regard to its etiology. Lomer ⁶_{Jan. 4} also describes a rare case in which a child was born with measles. The mother had not experienced the disease in childhood, and during an epi-

demic was seized with chill, cough, hoarseness, smarting of the eyes, and diarrhœa. Labor was not due for five weeks, but occurred prematurely on the following day. On the next day the mother was covered with the eruption of measles, the child also having dark spots on the forehead and buttocks. An interesting case is reported by Ballantyne,³⁶_{Mar.} in which an infant died thirty-two hours after a normal but prolonged labor. The autopsy showed extensive dry peritonitis of recent date, the intestines being distended with fetid gas and fluid meconium. The right Fallopian tube showed evidence of peritonitis of less recent origin. This condition is an interesting one, and gives rise to various conjectures as to the original cause of the peritoneal inflammation. If it were traumatic, an injury being received *in utero*, why should it have been localized in the right Fallopian tube? If it were septic, its localization in this area is equally singular. Nothing is known concerning the history of the mother. The case may be regarded as one of unusual obscurity as to its etiology.

Septic infection through the umbilicus is reported by Hirst,⁷⁶⁰_{p. 94} in a case in which an endocarditis on the right side of the heart resulted fatally during the eighth week. His method of treating the cord consists in cleansing it carefully, and then wrapping it in salicylated cotton. This was the third case of this character which had occurred within a year in the hospital with which he was connected. The experiments of Wolff⁵¹_{July} concerning the inheritance of infectious disease have furnished a very interesting chapter on this subject. He remarks that clinical observation can only rarely furnish the proof of the inheritance of such disease. In studying splenic fever he examined 29 fœtuses, and in none of them, nor in the fœtal chorion-cells, were the bacilli of splenic fever found. He also made 156 cultures of macerated fœtal tissue. In 6 of them there were bacilli of splenic fever, and with these he inoculated 13 young guinea-pigs and 16 white mice, 2 of the former and 1 of the latter dying from infection. Hence, he concludes that infection is rarely inherited from the bacilli of this disease, the fœtus being usually unaffected by splenic fever in the mother. Infection was believed to be possible at certain periods of pregnancy more than at others, and that differences in the anatomical structure of the placenta in different species of animals would account for varying degrees of susceptibility. He believes that healthy epithelium

furnished an effective barrier to the passage of bacilli. He concluded, therefore, that pathological conditions exist in the placenta if the bacilli of splenic fever pass through it to the fœtus, such conditions consisting in hæmorrhages in the maternal portion of the placenta, on account of bacillar thrombi, in necrosis of epithelium, injury of cell-vessels, or destruction of cells in the fœtal portion. In the experiments concerning vaccinia, 13 pregnant women were vaccinated at the tenth month, 5 at the ninth, and 7 at the eighth. In 11 of the cases the vaccination was successful, in 6 partially so, and in 3 it was a failure. The 17 children of the mothers who were successfully vaccinated were vaccinated between the first and fifth days of life, and in all of them the vaccination was efficient. Further experiments in the same direction led to the conclusion that successful vaccination of pregnant mothers did not influence their fœtuses. In certain cases, however, complications are conceivable, such as changes in the placenta on account of syphilis, pyæmic or septic conditions resulting from vaccination, and in such cases vaccinal infection may pass from mother to fœtus. With regard to variola, cases have been reported in which the disease has been transmitted from mother to fœtus. This is especially liable to occur in connection with hæmorrhagic variola, the germs being transmitted with the effusion of blood. True variolous pustules may also develop in the uterus of the mother, or in the other genital organs, and infection take place by contiguity.

CONGENITAL DERANGEMENTS AND DISORDERS.

Porak²⁹⁰_{Aug. 12} has made an interesting contribution to the subject of achondroplasia. This term was applied by Parrot to a disease which has been confounded with intra-uterine rachitis, and was denominated by Müller rachitis of cretins, and by Winkler micromelic rachitis. It is an anomalous condition of osteomyelitis of the first months of intra-uterine life, and not of the later months, like rachitis. It is recovered from at the time of birth. Many authors have accepted the view of Kassowitz, that rachitis beginning during the second year of life is a disease which begins at birth, and is about recovered from by the time the child is ready to walk. Achondroplasia is characterized by a general disturbance of the nutrition, depending, probably, upon the condition of the general nervous system, and coinciding frequently with hydro-

cephalus. The general disturbance is especially characterized by lesions of the cutaneous and osseous systems. The subcutaneous cellular tissue is usually thickened, there is a general increase in the volume of the bones, and an irregular arrangement of the epiphyseal chondroplasts. The latter lesion accounts for the flexibility of the cartilages, the diminution in the development in length of the long bones, and their increase in thickness. Hydramnios is almost always associated with it. From this frequently result premature deliveries, vicious presentations, and procidence of the cord. There may also be feebleness in the vitality of the fœtus, dystocia, and congenital weakness. If the disease is only slightly developed the infants may survive and be reared. Among adults, those who have suffered from this disease show characteristics similar to those from which infants suffer. They are of low stature, and show a want of harmony between the dimensions of the head and the trunk. The limbs are small, the patients are obese and micromelic. Otherwise, the physical and psychic development is not abnormal; the individuals may even be robust and be able to walk at an early age. The author has seen 4 cases of this disease. An analogous disease exists in the cow, the goat, the sheep, and the dog. It is thought possible that the characteristics of achondroplasia may determine the origin of a particular race. The pelvis of individuals with this disease constitutes a special type, its development being of the same nature as the development of the lower limbs. Its bones are small, and all its diameters contracted. Its inclination is decided and the sacrum projects strongly forward. Parturition with such pelves would be both difficult and dangerous, and would probably furnish an indication for the Cæsarean section.

Hennig ³⁶⁶_{B.30,H.1,2} reports a case of congenital aortitis which is the first of the kind he has ever seen. Heart-murmurs, which are sometimes heard while the fœtus is *in utero*, almost invariably disappear after the child is born. This case, however, was an exception. The mother of the child had a narrow pelvis, and this, her fifth baby, was the result of induced labor at the eighth month. The labor was difficult, the child was cyanotic when born, and efforts to resuscitate it were ineffective. At the post-mortem examination a quantity of dark, bloody fluid was evacuated from the abdominal cavity. One of the valves of the aorta

was contracted, all the other valves of the heart being normal. The defective valve had caused endocarditis and aortitis. The disease process was evidently of only a few weeks' duration, for the left side of the heart was almost normal. The hæmorrhage referred to above probably came from the liver, which was thick and very vascular. The cause of the disease in this case can only be conjectured. In addition to the conditions mentioned in the foregoing case, there was also an enlarged thymus-gland. This is a condition which has been referred to in a number of cases as a cause of sudden death. Grawitz³⁶⁶_{B.30,H.1,2} suggested investigations upon this subject, and has himself been occupied with such investigations. In one instance the newborn infant of a professor in a German university died very suddenly, and death was found to have been due to tumor of the thymus gland.

The literature of the year contains yet other illustrations of heart anomalies in the newborn. One reported by Miura³⁶⁶_{B.30,p.225} showed the following peculiarities: 1. The right ventricle was dilated, its trabeculæ being prominent and its papillary muscles thick and elongated. The atrio-ventricular valve had but two segments, and these had thickened borders. 2. The right auricle was dilated and extended to the root of the pulmonary artery. 3. The left ventricle was narrow, thin-walled, and with small auricle, which was far removed from the root of the pulmonary artery. 4. The vena cava inferior opened normally into the right auricle and the vena cava superior into the left auricle. 5. The pulmonary artery arose normally from the right ventricle, then each pair of pulmonary veins united in one main vessel, and these in turn in one main trunk, which also received the vena azygos and opened in the right auricle.

The aorta arose normally from the left ventricle, the innominate, the two carotids and subclavians proceeding from it in the usual way. The open ductus Botalli proceeded from the descending aorta to the right branch of the pulmonary artery, being thick-walled and about eight millimetres in circumference. The foramen ovale was open. Of course the circulation in this case was seriously compromised.

In Potiënko's³⁶⁶_{B.30,p.224} case of abnormal position of the heart that organ was as large as a hen's egg, was without pericardial covering, and was located to the left of the median line with its

base downward. The great vessels of the heart projected through a round opening about two centimetres wide, the thoracic cavity being closed below this opening. This opening corresponded to the anterior position of insertion of the diaphragm, under the lower border of the costal cartilages of the seventh, eighth, ninth, and tenth ribs, on the left side of the chest, close to the median line. The opening was entirely filled by the vessels. The skin was entirely normal, with the exception of a portion about three centimetres long and of a finger's breadth, this portion being pale red in color. The child lived only one hour.

Lannelongue's ³⁶⁶_{B.30,II,1,2} case was that of a child which was brought to the Trousseau Hospital in Paris at the age of 6 days. It was a feeble female, but was able to suck and digest normally. About the middle of the sternum there was an apparent loss of substance, covering an area of a twenty-five-cent piece. The surrounding skin was red and swollen. A yellow, gangrenous membrane was apparent at the site of the defect in the tissues. The heart contracted rhythmically and the contraction of the ventricle could be appreciated by the finger. The inner extremity of each clavicle articulated with the first rib, the sternum being absent at that point. Below, the sternum was divided into two parts, which coalesced further down. There was no history of syphilis or tuberculosis, both father and mother being in good health. After two days the gangrenous membrane disappeared, and then the apex beat became apparent at the lower border of the area of ulceration. Within a few days the granulating process greatly narrowed the area of exposed heart surface. Still it was deemed best to remedy the ectopic condition of the heart by surgical measures, and incisions were therefore made on both sides of the cicatricial ring, one and a half centimetres from its border. The flaps thus made were united with sutures, which did not secure union by first intention, but by the slower process of granulation. The heart was thus changed to a condition of subcutaneous ectopia which was certainly an improvement over the original condition. A case of lymphangioma cavernosum of the face and neck was shown at the Berlin Medical Society (see figure) by Guttmann. ⁴_{Mar.3} The tumor was present at birth, labor presenting no unusual complications, and the infant ate and slept well for four days, when it suddenly died. The tumor extended from the muscles of the

ears on either side to the upper part of the chest, but did not encroach upon the larynx and trachea. It was firm in some places and fluctuating in others. A dark, brownish fluid was removed from the cystic portions during life. This contained albumen and fibrin, also blood- and lymph- corpuscles and fatty matter. The specimen was carefully injected and sections were made for microscopic examination. The tissue was spongy in character, the firm portions being composed of connective tissue.



LYMPHANGIOMA CAVERNOSUM.
(*Berliner klinische Wochenschrift.*)

The tumor was caused by ectasis of the lymph-vessels and constituted, as has been said, a cavernous lymphangioma. It probably was due to deformities and defects in the lymph-vessels, the lymph accumulating and causing the enlargement. A somewhat similar case of lymphangioma of the neck and upper thoracic aperture of the thoracic duct was reported by Nasse.⁷⁵⁵ B. 38, H. 3 Nothing abnormal could be found in the thoracic duct of the case which is here narrated.

Congenital stenosis of the duodenum was found by Emerson ¹_{Aug. 9} in a male infant weighing $8\frac{1}{2}$ pounds, and born after an easy labor, lasting fifteen hours. When it was 33 hours old the child spat up half an ounce of dark blood, mingled with mucus, the act being followed by choking, with blueness and coldness of the extremities. This experience was repeated at intervals for the next eight or nine hours. Dark, tarry matter had been evacuated from the bowels before the blood-spitting began. There was neither cough, fever, nor respiratory trouble, and no desire for food. Attempts to administer turpentine, ice, milk, and water led only to regurgitation and bleeding. At the end of three and a half days a large quantity of dark, watery, and grumous fluid was vomited from the mouth and nostrils, and this discharge continued at intervals until death. The microscopical examination of the vomited matter showed oily matter and corpuscles of blood and colostrum. The bowels moved three hours before death, the movement being stained with bile. Death occurred at the end of four days and ten hours, the child being emaciated, but not extremely exsanguinated. The principal findings of the autopsy referred to the stomach and its surroundings. That organ was much dilated. The pyloric orifice was 2 centimetres in diameter. The duodenum was 3 centimetres in diameter, the distension reaching to a point immediately above the common bile-duct, where the lumen of the tube terminated abruptly. Fluid could not be forced below this point from the stomach, nor could air be forced from the intestines upward into the stomach. The constriction was not complete, however, for a medium-sized probe could be passed through. Below the constriction the small intestine and the large also were normal. The stomach contained a large quantity of brownish-black fluid. In the œsophagus, immediately above the cardiac orifice, there was a firm, dark, oblong thrombus, $2\frac{1}{2}$ centimetres in diameter, attached to the posterior wall of the œsophagus. The mucous membrane below the thrombus was eroded, which was all that could be ascertained as to the source of the bleeding.

Two other cases may be noted which bear somewhat on the foregoing. One is a case of congenital malformation of the œsophagus, causing absolute inability to swallow solids and, at times, liquids, reported by R. Humphrey Marten, ²⁶⁷_{May} and in which, by the exercise of great care, the child was fairly well nourished and

enabled to do without surgical assistance; and the other is a case reported by Rasmussen, ³⁶⁶_{May 8} in which a male infant showed difficulty in respiration, with tracheal râles, the day after birth. The child was inverted, a quantity of mucus was released from his mouth, and there was temporary improvement. He would not nurse, and what was fed to him with a spoon was returned immediately. It was impossible to pass a sound into the stomach, as it was always arrested at a certain point. The child died on the following day, when it was found that the upper portion of the œsophagus, 5 centimetres below the larynx, opened into an ampulla-like dilatation. The distance to the cardiac orifice of the stomach was 8 centimetres, and communication with this opening was completely shut off. A very small fistula was found, leading from the anterior wall of the œsophagus into the trachea, $4\frac{1}{2}$ centimetres from the bifurcation. The lower portion of the œsophagus communicated with the trachea by an opening 17 millimetres long and 4 broad. The pyloric end of the stomach was narrow, and in the ascending colon there were two constrictions. The remainder of the intestinal canal was normal.

An interesting series of questions has been suggested by Verneuil, ⁵¹_{Nov.} in regard to supposed congenital luxations of the hip. He does not deny the existence of intra-uterine luxation, but believes that coxo-femoral luxations occurring at the time of birth are very rare. He and his assistants have made hundreds of examinations upon dead fœtuses for the purpose of determining this point. On the other hand, Verneuil believes that many of the cases of luxation supposed to be congenital are the consequents of muscular lesions in connection with infantile paralysis. Usually the diagnosis of cases of so-called congenital luxation of the femur is made about the age of 2 years, when parents are disturbed at the ineffectual attempts of a child to walk as a child of that age should walk. Verneuil offers a prize of 300f. for every case, not to exceed 10 cases, in which a dissection will clearly demonstrate the existence of this lesion; the dissections to be made during the current year. Excluded from this offer are luxations consecutive to other accidents, or malformations in which the head of the femur is wanting, or other malformations of the hip in non-viable monstrosities.

A very important subject has been discussed by Patrzek, ⁵⁷_{Apr. 6} concerning deviations of the nasal septum in the newborn. Here-

tofore Zuckerkandl's statement has been accepted as authority that deviations of the septum do not occur until the seventh year. Lewy had stated, however, that he had seen nasal deviations at the sixth and even at the fourth year. Voltolini also had declared that such deviations were due to causes which were active during the second dentition. The differing opinions upon this subject suggested to the author a series of investigations upon newborn infants to determine (1) whether deviations of the nasal septum occur in the newborn, and (2) whether the processes during parturition have any causal relation with such deviations.

The second question has not yet been decided, neither have

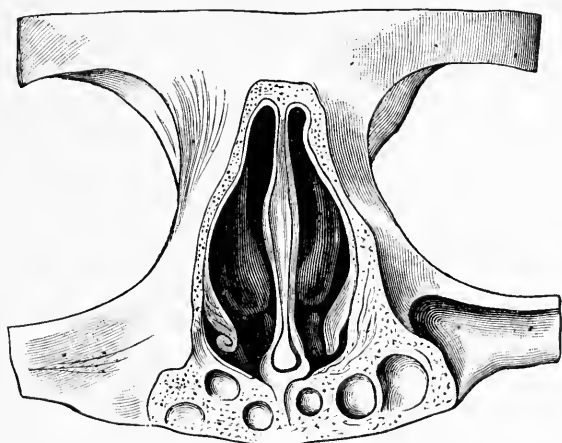


FIG. 1.—DEVIATIONS OF THE NASAL SEPTUM IN THE NEWBORN.
(*Internationale klinische Rundschau.*)

investigations upon the living been concluded. On the other hand, investigations were made upon the bodies of three infants, which showed that deviations of the nasal septum might exist even at birth. The accompanying figures show the conditions which were found. In Fig. 1 there is a section in the anterior portion of the nasal cavity. The septum is normal. Between the anterior ends of the middle muscles the swollen mucous membrane is well shown. On the living newborn infant this condition must not be confused with a deviation of the septum. Fig. 2 shows a frontal section just anterior to the orbital walls. The left lower and middle muscles have been removed. At the lower end of the septum there is a manifest deviation toward the right, such

as is often found in adults. In Fig. 3 the section was made just behind the borders of the orbits. The upper third of the septum deviates to the left. Thus, in cases 2 and 3 there are evidently

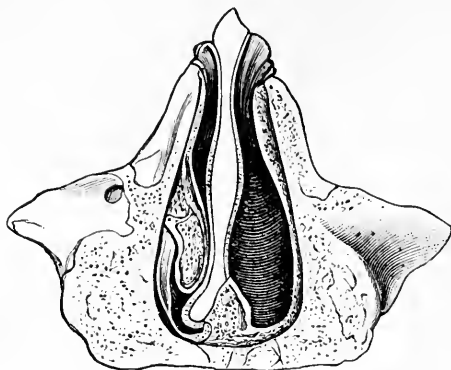


FIG. 2.—DEVIATIONS OF THE NASAL SEPTUM IN THE NEWBORN.
(*Internationale klinische Rundschau.*)

deviations which occurred *in utero*, but whether congenital or acquired cannot positively be stated.

Cases of congenital ascites are rare. Courmont²¹¹_{Feb. 16} states that they have been mentioned by Guillemeau, Van Gelder, and Porak,

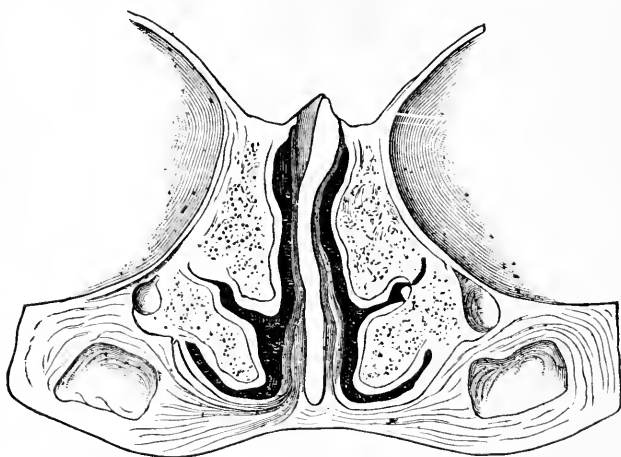


FIG. 3.—DEVIATIONS OF THE NASAL SEPTUM IN THE NEWBORN.
(*Internationale klinische Rundschau.*)

and he gives an account of a case recently seen by himself. The mother of the child was 21 years of age, in poor health, and of tuberculous history. The labor was a severe one. A considerable

time elapsed after the passage of the head before the delivery of the abdomen, the latter being of enormous volume. The child was cyanotic. By immediate puncture the author succeeded in withdrawing 500 grammes of fluid, with the result of immediate improvement in the child's condition. The fluid which was withdrawn was transparent, yellow, alkaline, and contained flocculi of fibrin. An analysis revealed the presence of albumen, urea, chloride of sodium, and phosphoric acid. There was no sugar and no bile.

Among the rare forms of injury which may happen to an infant during parturition is one which is mentioned by Heydrich.²¹³
The breech presented and the funis prolapsed into the vagina. The pelvis of the mother was flattened, but delivery was effected without severe traction. Schultze's method was effectually used for the resuscitation of the child, but two hours later it was found dead in its cradle. Examination showed a swelling extending upward as far as the upper jaw and downward as far as the eighth rib. There was emphysema and the circumference of the neck was nearly equal to that of the head. The skin was uninjured. On opening the abdomen the liver was found much depressed. The right pleural cavity was full of air; the right lung was collapsed and contained a minute opening, with a corresponding one in the parietal pleura. The clavicle was fractured and there was emphysema in the anterior and posterior mediastinum. The author believes that the injury to the pleura was caused by bringing down the arms in the process of delivery. Meyer, in commenting on the case, believes that the injury was caused by the swinging of the child in performing Schultze's method of resuscitation,—a method of which he disapproves, especially in cases in which there is fracture of the clavicle or humerus.

Eve⁶
Nov. 14, '89 reports a case of congenital tubercular tumor on the right side of the face of an infant 8 weeks old, which tumor had been apparent since birth. When removed it was found to be made up of nodules, in which were giant cells surrounded by masses of leucocytes. The nodules were embedded in fibrous tissue, which was mingled with the ordinary structure of the cheek. The existence of such congenital tumors has been doubted by some writers (see Wolff's statements in a preceding paragraph), but both clinical and experimental evidence has been accumulating

which tends to show that tuberculosis may be transmitted from mother to fœtus.

In a female infant which was seen by Clarke,⁶_{Dec. 21, '89} and which died a few hours after birth, hydrocephalus, spina bifida, and double talipes were present. Hips and knees were flexed at birth, and the feet were crossed and fixed by four turns of the umbilical cord. An important question affecting this and similar deformities is whether they were caused by the existing mechanical obstructions.

Two cases, with interesting features, are reported by Bayer.³⁶⁶_{May 8} The first was an atrophic male baby 10 days old, with meningo-myelocoele as large as an apple in the lumbo-sacral region. The skin covering the tumor was red, inflamed, and necrotic, and it had an opening of a finger's breadth in the region of the last two dorsal and first two lumbar vertebræ. The necrotic portions were disinfected and removed; two lateral flaps were made on the skin surface of the tumor; then the tumor was opened, the cauda equina separated from the inner wall and laid in the spinal canal, the sac was removed, and the wound carefully sutured. On the fifth day the sutures were removed. Cerebro-spinal fluid oozed from a fistulous opening for six days, then a silk suture was extruded. The child did well for a time, but died at the end of two months amid very unhygienic surroundings, and with enlarged cranium, myosis, hemiplegia, and paralysis of the left facial and hypoglossus. In the second case there was meningocele on the posterior half of the greater fontanelle and a cystic meningo-myelocoele as large as a child's head in the lumbo-sacral region. There was paresis of both lower extremities, with incontinence of urine and fæces. The tumor was punctured and 880 cubic centimetres of cerebro-spinal fluid removed. Subsequently two transverse skin flaps were made, the tumor was ligated and then removed. In the posterior wall of the cyst, at its upper pole, was a portion of spinal cord 6 centimetres in length, the cavity being bounded posteriorly by the spinal cord and everywhere else by the arachnoid membrane. A month after the operation the child seemed entirely well.

DISEASES AND DISORDERS OF THE LUNGS.

Dohrn¹⁶²_{Nor., '89;}¹⁵⁷_{Apr.} has studied the mechanism of respiration in the newborn and has reached the following conclusions: 1. The respi-

ration of the newborn is thoracic. 2. The elevation of the thorax begins at the summit and descends progressively. 3. The tidal air averages 35 cubic centimetres and reaches a maximum of 120 cubic centimetres. 4. The exchange of air is feeble in the first days after birth. At the end of the first week it is a third larger than the first day. 5. Generally at the first inspiration the lungs are not filled with air, the alveoli unfolding only on the second day, which is a fact of medico-legal importance. 6. The respiratory curves of the newborn present no stationary points.

Respiration in prematurely-born children has been studied by Glöckner,⁵_{Apr.} who reports three cases in which respiratory movements were followed by marked increase in the vigor and frequency of the heart's action. One of these children was born at four months, one at fifteen weeks, and one at nineteen weeks. The mouth was open in these cases during respiratory movements and the movements lasted a little longer than an hour. On post-mortem examination the lungs were not inflated and sank when placed in water. The stomach contained air, and there were evidences of oxygenation of blood in the heart. The conclusion is that the foetus swallowed air, and that oxygenation of the blood in the gastric vessels resulted, which increased the vigor and frequency of the heart's action. Schultze, in criticizing these cases, admits the accuracy of Glöckner's observations, but considers that the amount of oxygen obtained by the foetus in this manner is too small to play any part in respiration. He would inflate the lungs and employ artificial respiration in cases of asphyxia in which arterial and venous tension are nearly equal. If arterial and venous tension are unequal, he believes that his method of inflation of the lungs by swinging the child is the most efficient.

In view of the frequency with which the ribs are resected nowadays for disease of the pleura and lungs, the question of hernia of the lungs becomes an important one, and in connection with this subject Hochsinger³⁶⁶_{B.30,H.1,2} has rendered good service in his paper on hernia and abscess of the lungs in infancy. Hernia of the lungs may occur, it is evident, with normal or deformed or pathologically changed organs, the opening in the thoracic wall being a congenital or a pathologically acquired defect. The hernia may take place through the opening which was designed for the passage of the large blood-vessels. The so-called congenital

hernia of the lungs rarely occurs before the second or third week of life, and usually not until several months of extra-uterine life have passed. forcible movements of respiration, as in coughing, with the consequent sudden difference of pressure between expiration and inspiration, form a common cause of this variety of hernia. Defects in the ribs may cause congenital hernia. The tumor in such cases is quite perceptible externally, and usually replaceable, unless adhesion to the parietes has taken place. Percussion in such cases yields either a tympanitic or non-tympanitic resonance, and auscultation a murmur or crepitant râle. In such herniæ there may also be deformed or diseased portions of lung-tissue. Such a case has been described by Frühwald, and descriptions have also been given by Fürst and Birch-Hirschfeld.

A curious case of fibrinous pneumonia of congenital origin is reported by Levy.^{5 Aug.} The mother of the child, aged 30 years, died of double fibrinous pneumonia, complicated with pleurisy and pericarditis. Cultures of the fluid removed from her thorax showed the diplococcus of Fränkel and Weichselbaum. The child of this woman was born thirty-six hours before her death, and it died two days later of hæmorrhagic catarrhal pneumonia, with lobar fibrinous pneumonia, the autopsy demonstrating the fact that the pneumonia of the child was infectious, and had existed at least thirty-six hours before its birth. Cultures made with fluid removed from the left ventricle of the heart and from the right lung showed the presence of the diplococcus. The micro-organisms were very numerous in the blood, and the conclusion is warrantable that infection took place from the disease of the mother.

BLOOD LOSSES AND DISORDERS.

The most common form of hæmorrhage in the newborn is that which proceeds from accident to or disease of the umbilicus. In poorly-nourished and deficiently developed infants, with insufficient muscular fibre, there are conditions which require that hæmorrhage should be anticipated by precautions and watchfulness which would often be superfluous in more robust children. In a case reported by Campbell,^{51 June} the conditions of the child being such as have been noted, hæmorrhage occurred on the ninth day, four days after the stump of the cord had fallen, when all was

apparently progressing favorably. The bleeding was profuse, was not relieved by pressure with the thumb, by the application of dry tannic acid, by the injection of a solution of the same into the umbilical veins, nor by the similar use of gallic acid. Only when needles were passed through the vessels at right angles to each other and the entire stump firmly tied under the needles did the bleeding stop. The ligature was removed too soon, and there was much hæmorrhage on subsequent days until the entire stump was tied *en masse* again. The child slowly recovered. It was the victim of hereditary syphilis, and received the appropriate internal medication. Eliot¹⁹_{Dec.14,'89} reports 4 cases of the same condition. As causes this author enumerates carelessness in applying the ligature to the cord, forcible avulsion, fungoid excrescences following the separation at the point of ligation; or it may be of apparently spontaneous origin, as in the foregoing case of Campbell. Males seem to be more subject to such hæmorrhages than females. The author has made a careful search of the literature of the subject, and has found records of 261 cases in which umbilical hæmorrhage has occurred. He suggests local and constitutional methods of treatment. The former consist in the application of a fresh ligature, compression, ligature *en masse*, and the use of tannic acid, subsulphate of iron, acetate of lead, spirits of turpentine, plaster of Paris, and collodion. The latter consist of good milk diet, calomel, sulphate of soda, muriated tincture of iron, aromatic sulphuric acid, ergot, brandy, and general tonic measures. As a last resort, abdominal section may be performed and the cord be ligated before it issues from the abdomen. He performed the operation in one case, but the child was already too far gone for a successful result, and lived only thirty-eight hours after the operation.

Brown²_{Sept.14,'89} reports a case of hæmorrhage from the bowels in an infant 32 hours old. Blood was also vomited and the hæmorrhage continued twelve hours. Hamamelis was then given and the bleeding ceased. Hæmorrhage from the intestines with a fatal issue was reported by Bourrus¹⁸⁸_{Apr.13} in an infant 8 days old, the bleeding having continued thirty-six hours. The autopsy showed that the bleeding proceeded from an ulcer of the duodenum which had perforated the organ. The cause of the injury was not ascertained. In Hodges' case,²_{Dec.14,'89} there was hæma-

temesis in an infant 6 hours old. Hazeline, in 10-minim (0.62 c.cm.) doses, was given every two hours; the bleeding was checked and the child recovered. Other symptoms seemed to indicate that there might have been a fracture of the base of the skull, which probably occurred during delivery, though it was stated that the labor was an easy one. The value of hazeline in this case seems to have been decided, though it is difficult to see how it could have acted if the hæmorrhage really proceeded from fracture of the base of the cranium.

Fairbrother⁶⁵_{Mar.} reports a case of hæmorrhage from the vagina in an infant 2 days old. Astringent injections were used daily for a week, and at the end of that period what appeared to be a polypus was extruded. There was no more bleeding, and the child did well from that time. The polypus was supposed to have come from the uterus. Such an occurrence is sufficiently rare to be worthy of record.

Hue²⁰³_{May} reports a case of hæmaturia beginning on the second day and continuing through the fourth. It then ceased, apparently spontaneously, the child thriving subsequently. Whether the bleeding proceeded from the bladder or the kidneys is a question. In the greater number of these cases one is forced to believe that there must be a traumatic origin when the bleeding occurs so soon after birth; but it is very difficult to speak with positiveness, when nature is kind enough to provide a remedy before the vital forces are exhausted.

Of intra-cranial hæmorrhages Hirst¹¹²_{p.344, '89} reports 2 cases. In the first, delivery was effected by the breech, and it was thought that the effusion occurred into the cavity by exudation during extraction of the head. In the second case the vertex presented, and there was an interval of fifteen minutes between the birth of the head and the expulsion of the body. The hæmorrhage in this case was probably due to the long-continued constriction of the foetal neck and consequent passive congestion of the brain.

Schiff⁴⁰⁵_{B.11} adds another to his previous contributions on the quantitative relation of the blood-corpuscles and the hæmoglobin in newborn children and infants under normal and pathological conditions. He found, under normal conditions, that the number of red corpuscles during the first day of life is the greatest, but that during the day their number diminishes. This diminution is

subsequently interrupted by daily variations. The number of white corpuscles during the first three or four days is considerable, but subsequently becomes decidedly less. The absolute volume of hæmoglobin varies in different cases, but gradually becomes less and varies on different days. Under the influence of a febrile temperature, even if very moderate, there is a diminution of the red corpuscles, but this is followed by a normal state as soon as the temperature again becomes normal,—that is, in the course of a few hours. If the febrile process is of longer duration, the number of red corpuscles gradually diminishes. The white cells increase in number with the access of fever, but there seems to be no other relation between these two factors. As the blood-corpuscles decrease in number with the beginning of fever, so also is there a diminution in the volume of hæmoglobin, and this diminution increases as the febrile process continues. Great losses of blood are almost always well borne by infants if they do not occur too suddenly.

DISEASES OF THE LIVER.

Hatfield⁵¹_{Jan.} reports 2 cases of congenital pernicious icterus in the same family. The first occurred in a male infant, who weighed $7\frac{7}{8}$ pounds at birth. The labor had been normal, but the mother lost considerable blood post-partum. The child was well nourished, but almost as soon as born he began to vomit a frothy, greenish-yellow fluid. The sebaceous matter with which the child was covered at birth was greenish yellow in color. The skin became intensely yellow by the fourth day, the mucous membrane and the secretions of the mouth sharing in the discoloration. The vomiting continued at irregular intervals, food being taken with a spoon, but not digested. The urine was scanty and yellow, the stools were yellow or green, and after the second day there were hæmorrhagic petechiæ on the face and trunk. On the ninth day there was partial detachment of the remnant of the cord and free bleeding from the umbilical vessels. Death occurred on the thirteenth day, from exhaustion. The remnant of the cord had not come away properly, and there was a dry, fetid stump, but no evidence of arteritis or phlebitis. The liver and spleen were removed post-mortem, for examination. The liver presented signs of cirrhosis and the spleen was much enlarged. In the liver were a number of circumscribed circular or ovoid islands of connective tissue,

surrounding the gall-ducts; in fact, there was biliary cirrhosis, or the variety which is termed by the French *cirrhose hypertrophique avec ictere*. Lesions in the lungs were also found analogous to those in the liver. The second case was the child of the same mother, and developed intense jaundice in the same way as the previous case, dying on the thirteenth day. Bushong³⁶⁶_{Mar.8} has reported a case which bears a strong resemblance to the foregoing, but it may be considered in general that liver disease of this character belongs to adult life. What its origin was in these cases must be left to theory.

DISEASES OF THE GENITO-URINARY APPARATUS.

Complete prolapse of the uterus in a newborn infant is one of the rarest of accidents. Quisling³⁶⁶_{Mar.8} reports such a case. The child was a well-developed female, but with double club-foot and spina bifida, and presented by the breech. On the seventh day prolapsus vaginae was apparent; the rectum had prolapsed previously. On the eighth day the uterus was completely prolapsed. It could be readily replaced, but recurred immediately. Persistent diarrhoea set in on the twenty-fourth day and death resulted twenty-four days later. The autopsy showed a normal condition of the abdominal and pelvic organs, except that the broad and round ligaments were relaxed and the lower segment of the uterus was enlarged. The perineum was in good condition. There had been catarrhal trouble of the large intestine on the first days of life, with more or less tenesmus, but it hardly seems probable to us that this would have sufficed to produce so exaggerated a condition of relaxation and prolapse. We beg to differ with Quisling in this view of the subject. Jacobi,⁵¹_{June} in a paper on diseases of the genito-urinary organs, calls attention to the necessity of preventive treatment of the kidneys as early as the first hours of life. This is due to the fact that relatively large quantities of uric acid and urates are wont to be eliminated during the first two or three weeks of life, on account of the sudden changes in the circulation of the blood as extra-uterine life begins. This fact suggests the free administration of water to infants, that the formation of renal and vesical calculi may be prevented. The same paper alludes to the not uncommon occurrence of abnormalities in the shape of the kidneys, and to congenital malignant diseases of the same organs.

A specimen of the so-called horseshoe kidney was seen by Arbel⁵_{Aug.} in an autopsy on a 7 months' foetus. The organ reached as low as the border of the second sacral vertebra. It had two ureters, which led to the bladder in the usual manner.

Hirst⁷⁶⁰_{Jan. 18} calls attention to the necessity of careful examination of those cases in which, during the first few days of life, there is apparent retention of the urine. The error may be due to the fact that the urine of the newborn infant usually does not stain the diaper. That this is not always the case, however, must be remembered, and Jacobi, in an article already quoted, has called attention to the frequency with which the napkin may be stained by urine containing an abundance of urates. If retention of urine is suspected, the question of distension of the bladder must be investigated. As to hydronephrosis resulting from obstruction of the valve-like terminations of the ureters at their vesical end, Hirst thinks that such a cause is one of great rarity.

The existence of hydrocele in the newborn has been questioned by some writers. Others are as positive that it occurs, and that frequently. Among the latter is Wechselmann,⁵¹_{Apr.} who states that he has frequently observed it during the first few days of life at the Dresden Lying-in Hospital. He noted it in 37 out of 270 male infants, and in 14 of the cases it communicated with the peritoneal cavity. In 2 cases it was on the left side, in 4 on both sides, and in 31 on the right side. The tumor varied in size from a cherry to a plum, or even larger. Most of the children were not under observation later than the eleventh day of life. Those who deny its existence may have overlooked it in some instances, owing to its small size or the fact that it was obscured by œdema of the scrotum. In some cases it originates *in utero*, the vaginal process becoming closed by trauma. In other cases the testicle is injured in the course of its descent, or there may have been trauma during labor, or there is inflammation of the testicle or cord *in utero*. Wechselmann does not believe that it is due to disturbances of the circulation, or to increased arterial flow to the testicle.

Séjournet⁵¹_{sept.} gives to the condition the term *orchi-vaginalitis*. In all the cases in which he has seen it, the infants were the subjects of erythema, either of the genital organs, the thighs, or hips, the cutaneous affection progressing to the urethra and then to the

cord, where the serous effusion was excited. Thus it is considered by Séjournet as a kind of erysipelatous affection, infectious, of course, in character. In none of the 6 cases which he recorded was the condition congenital, but in all of them it was discovered between the ages of 15 days and 6 weeks. In all his cases the condition resulted in cure, the treatment consisting in applications of borated vaseline, or vaseline with the addition of iodide of potassium, or talc-powder, or soothing lotions, together with moderate pressure from a layer of cotton-wool.

DISEASES OF THE EYES.

Conrad⁵¹_{Sept.} publishes a statistical table of blindness resulting from blennorrhœa neonatorum. In Saxony 75 per cent. of the blindness is due to causes existing during the first days of life. Crédé attributed the disease to the purulent gonorrhœal secretion in the vagina of the mother, by which infection occurred during parturition. As a means of prophylaxis for pregnant women suffering with gonorrhœa, Conrad suggests the following formula:—

R	Acidi tannici,	25.	grammes (36½).
	Spts. vini rectific.,	25.	" (36½).
	Glycerinæ,	75.	" (32 33).
	Acidi carbol.,	2 5	" (gr. 38).—M.

This should be applied to the vagina every day or two for some weeks before the beginning of labor, if there is desquamative blennorrhœa of the vagina. If the blennorrhœa is purulent, the vagina should first be cleansed with hot water, or a 1-to-4000 solution of sublimate, and then a 3-per-cent. solution of nitrate of silver should be applied. Irrigation of the vagina with sublimate solution should be practiced during parturition. After the birth of the child its hands, head, face, and external portions of the eyes should be washed with hot water or a 2-per-cent. solution of carbolic acid. Crédé's well-known method consists in instilling 1 drop of a 2-per-cent. solution of nitrate of silver into each eye soon after birth. The silver solution should always be fresh, and a compress of 3-per-cent. borated cotton should be adjusted after the instillation. During the six years in which this plan has been followed in the Maternity Hospital over which Crédé presides, there

have been 714 births and not a single case of blennorrhœa neonatorum.

Brunon²⁰³_{Feb. 15} objects to the rigid application of Crédé's method, as of doubtful utility. He prefers to wait until the blennorrhœa appears, and then use Crédé's method, or a 3-per-cent. solution of nitrate of silver, applied to the eyes every twelve hours, followed with an irrigation of boric-acid solution. There are others who have objected to Crédé's method, but objections are valueless in the presence of such results as have been obtained by those who have followed his directions with the greatest scrupulousness. An ounce of prevention in a grave disease like this is worth many pounds of cure.

DISEASES OF THE SKIN.

Northrup⁵¹_{Jan.} reports a case of sclerema neonatorum, a disease which is rare in this country and not common in England, France, or Germany. The author has seen but one case during six years' experience at the New York Foundling Hospital and a service of 7000 infants. This case in question was a female, weak, jaundiced, and affected with spine disease; and when seen, at the age of 5 days, it had a rectal temperature of $96\frac{1}{2}^{\circ}$ F. The tissues were hard and cold, including the legs, thighs, hips, shoulders, arms, hands, scalp, and face. The face was rigid, cold, and mask-like, the thighs and shoulders immovable, and the elbows and knees stiff. Its radial pulse was imperceptible, its respiration shallow and quiet, and on the ninth day it died. Section of the tissues was like cutting half-frozen fat; there was no escape of blood or serum from the incised surfaces, and there was no œdema. The skull and brain were normal. The lungs had been fully aerated and were nowhere collapsed. The heart and great vessels were normal, the foramen ovale closed. The kidneys, stomach, intestines, liver, and umbilical vein were normal. Morphological study of the skin gave a result equally negative with that of the other tissues. This disease in the newborn is to be differentiated from œdema. In the latter there is also a lowering of the body temperature, the same as in sclerema, and the œdematous regions may become firm, but not to the same extent as in sclerema. Parrot found all the elements of the skin changed in sclerema, some being increased and some diminished, and the cases always occurred in infants who were in the last stages of obstinate intestinal disease. Northrup

accepts Langer's explanation of the hardening of the subcutaneous tissue in this disease, which is, that children's fat contains more palmitine and stearine than that of adults, and solidifies when the temperature is moderately depressed. Ballantyne²_{Feb.22} has also reported a case of this disease, but his theory as to its origin differs from Langer's. He believes that the hardening of the skin is due to overgrowth of connective tissue, leading to atrophy of the fat-cells, the whole process depending on a trophic lesion of the nervous system.

In the New York Infirmary for Women and Children, there recently occurred an epidemic of pemphigus. Of 11 children who were born during one month, 8 developed the disease.

Kilham,²⁷_{p.1039,79} who reported the epidemic, states that in all cases the disease appeared on the second, third, or fourth day. The vesicles developed rapidly, the contents becoming purulent on the second day. No bacilli were found in the fluid. The disease continued from one to three weeks, all parts of the body being affected except the soles of the feet and the palms of the hands.

DISEASES OF THE NERVOUS SYSTEM.

Farago,³⁶⁶_{B.30,H.1,2} found that direct irritation of the nerves and muscles in newborn children with the electric current did not give any positive results on account of restlessness, decided tonus of the muscular tissue, thick layer of fat, etc. Eulenburg tested the tendon and skin reflexes of 17 children on the first day of life, and found the knee phenomenon in 16 of them. As the infants grew somewhat older, this phenomenon became less decided. The skin, mucous membrane, and pupil reflexes were always present.

Farago investigated the subject of the knee-jerk on the persons of 68 healthy female infants and 49 males, their ages ranging from the moment of birth to the sixteenth day. The experiment was tried while the child was nursing, when the muscular tissue was relaxed. In most of the cases the leg jumped quickly forward, or there was a clonus of the quadriceps femoris of short duration. Occasionally the irritation was apparent on the side which was not struck, and in some cases the effect produced was very slight and transient. The patellar reflex was found to be especially noteworthy soon after birth, subsequently becoming less pronounced, but it was less marked in weak and premature chil-

dren than in those who were robust. The abdominal reflex was always apparent by slight irritation with a needle over the mons veneris, irritation of the lower extremities was always producible by stroking the soles of the feet, and closing of the eyelids by touching the cilia or the cornea. The cremaster reflex was sought in 49 males and was found in all but 9 cases. Thus the activity of the cutaneous nerves, even at this very early period of life, was positively demonstrated.

Trismus nascentium is one of the most fatal of the diseases of the newborn. The theory of Marion Sims as to its origin, namely, that it is caused by pressure upon the occipital bone, could hardly have obtained much credence with any who believed in the power of infection and remembered the open door of the umbilical wound. As early as 1851 Watson, of Charleston, refuted Sims's theory and attributed the malady to an infectious source. Two cases of the disease are reported by Fussell.^{9 Feb. 8} One of these began two hours after birth and was fatal forty-six hours later. There was no history of infection in this case, but of a severe forceps delivery; in fact, the case cannot be considered one of true trismus nascentium. In the second case the tetanic spasm began on the ninth day and continued without intermission for twenty-four hours, death then resulting. There was an unhealed umbilical wound, through which infection was probably received. An interesting case is also narrated by Pérochaud,^{127 May 6} occurring in an infant at the fifth day of life. In this case, also, there was a purulent wound of the umbilicus, the remnant of the cord having already become detached. Death occurred forty-eight hours after the beginning of the spasm. The experience of Edson,^{186 July} with remarks as to the etiology of this disease, in which stress is laid upon unsanitary and unhygienic surroundings and the very decided influence of traumatism during labor, is given in the literature of the year, as is also that of Williams,^{61 Apr. 26} who, in thirty years of experience, had become conversant with 13 cases. The latter adds to the list of causes the predisposing influence of syphilis or alcoholism in the parents. It may be said, in a word, that anything which tends to lower the nutrition of the fœtus while *in utero*, or of the child after birth, and any elements which are conducive to the septic state, may be regarded as a part or the whole of the etiological factors of trismus nascentium.

THERAPEUTIC AGENTS AND METHODS.

A series of experiments has been made by Schwing⁷⁶² to determine the value of creoline in diseases of the newborn and nursing infants. In 10 cases of purulent ophthalmia of the newborn, irrigation was practiced with a 1-per-cent. solution of creoline. In 2 mild cases a cure resulted in six days. In the other 8 it was used four or five weeks without success. Subsequently a 2-per-cent. solution of nitrate of silver was used with good result. In 11 cases of muguet and aphthæ, solutions of chlorate of potash, permanganate of potash, and boric acid were used a long time without result. A 1-per-cent. solution of creoline was then used, and was followed by cure in five to seven days. For omphalitis an unguent of pure creoline was rubbed on, and all traces of inflammation disappeared in four days. In cases of erysipelas creoline was rubbed on the patches with good results. For acute gastro-enteritis in young infants, the following formula was used :—

R Creolini,	.	.	.	.	.	.	gtt. 3.
Aq. cannellæ,	.	.	.	.	.	.	32½ (80.0 grammes).
Syr. hibisei,	.	.	.	.	.	.	35 (20.0 grammes).—M.

Sig. : A teaspoonful every hour.

Asepsis of the surface and cavities of the body may be obtained with a 1-per-cent. solution of creoline, without the danger of poisoning which may result from solutions of carbolic acid or sublimate. Alcohol was used successfully by Henrique de Sà³⁶⁶_{May 8} in a case of erysipelas. The child was 6 days old, infection had occurred at the umbilicus, and there were patches upon the epigastrium and both hypochondria as far as the genital region. The pulse was frequent and the temperature per rectum 40.3° C. (104.5° F.). There was dyspnœa and diarrhœa, and the child became extremely weak. A mixture was ordered containing 8 parts of cognac, 10 of simple syrup, and 90 of water. Teaspoonful doses were given hourly, and the dose was doubled when it was observed that the erysipelas was spreading. Borated vaseline was also used locally. The disease continued to spread, and syrup of ether and tincture of valerian were added to the mixture; also, a decigramme (1½ grains) of quinine was given every four hours. After eleven days the temperature fell and healing began to take place. By degrees the doses of alcohol were dimin-

ished, and in three weeks the child was cured. Equally good results were obtained in another case in which alcohol was used.

Revulsive medication in the newborn has been investigated by Lutaud,²³ especially in connection with thoracic inflammations. The suddenness of onset of such diseases in children requires means which will act rapidly. The sensitiveness of the skin of the newborn forbids the use of some revulsives which are available for adults, but the sinapism will usually be found satisfactory. Prepared mustard leaves are better than the home-made mustard paste, and by placing a layer of thin rubber tissue between the mustard and the skin there need be no fear of using it for even the youngest infants.

HYGIENE OF THE NEWBORN.

Too much care cannot be taken in properly preparing an infant for vaccination. The force of this will be evident when one remembers that improper vaccination has been followed by lymphangitis, erysipelas, syphilis, etc. The following precautions should be regarded: 1. The skin of the region of inoculation should be washed with soap and water and then with an antiseptic. 2. The lancet should be sterilized by heat, and the degree of heat should be sufficient to insure the destruction of any germs which could possibly be associated with it.

Antisepsis in connection with the feeding of infants is beginning to receive proper attention. For children who must be brought up on the bottle there should be several simple nursing-bottles available. After each nursing the bottle should be taken apart, washed with alkaline water, and a bristle brush passed through all tubes of glass or rubber, the outside of each being carefully washed also. The bottle which has been washed should then be placed in a solution of boric acid and kept there until it is required for further use. No one has done better service in arousing attention to the subject of antisepsis in the hygiene and diet of infants than Epstein.³⁶⁶ He has called especial attention to the value of prophylaxis in diminishing the mortality among newborn infants from pyosepticæmia. The diagnosis in such cases is not easy. The patient can answer no questions, and chill and fever may be absent. In diseases of this character, intestinal

catarrh is a common phenomenon, and also great debility, which may have been present since birth. The disease is rarely acquired *in utero* or *inter partum*. Septic matter often enters by the navel, and the danger of such infection during the first few days of life is great. By the mouth the infection of diphtheria, septic croup, and aphthæ may be acquired. Antiseptic precautions are especially demanded for the umbilicus and the eyes, and, as to diet, the milk should be sterilized if artificial feeding is necessitated.

Nasi ⁷⁶²_{May 1} has laid down a series of very reasonable propositions in regard to the bearing of inanition upon infantile mortality during the first month of life, which are as follow: 1. The ultimate cause of the greater number of deaths during the first month of life is inanition. 2. It may exist in those who are apparently strong at birth, as well as in the congenitally feeble. 3. Proper nutriment is therefore a matter of first consideration, and it must be given in the proper way. 4. Maternal nourishment is the most suitable, if attainable. It may be taken directly from the breast or, by very feeble children, from a bottle. 5. If a wet-nurse is employed, her confinement must have been of recent date. 6. If her milk has colostrum corpuscles, properly prepared milk must be used instead. 7. Vessels for holding the milk must always be aseptic. 8. Prepared milk may be entirely efficient, especially for infants who are too feeble to suck. 9. Forced nourishment will occasionally be necessary, and in this way even 6 months' infants may sometimes be reared. 10. The better the hygienic surroundings, the more satisfactory will artificial nourishment prove. 11. Mixed alimentation will save some infants who would otherwise perish of inanition.

The forced alimentation to which allusion was made in a previous paragraph, and by which even 6 months' infants may sometimes be reared, is recommended by Tarnier and Le Gendre. The method is simple enough, and consists in the use of a No. 16 soft French catheter and a glass funnel. The infant is placed horizontally on the nurse's lap, with head slightly raised. The catheter, which has been warmed and dipped in sterilized milk, is then passed into the mouth and gradually worked into the pharynx the same as for irrigation of the stomach. The swallowing movements which are excited will assist in guiding the catheter in its passage downward. Then the food at a temperature of 95° F. (35° C.)

may be slowly poured through the funnel. The catheter must be withdrawn rapidly when feeding is concluded, the forefinger of the

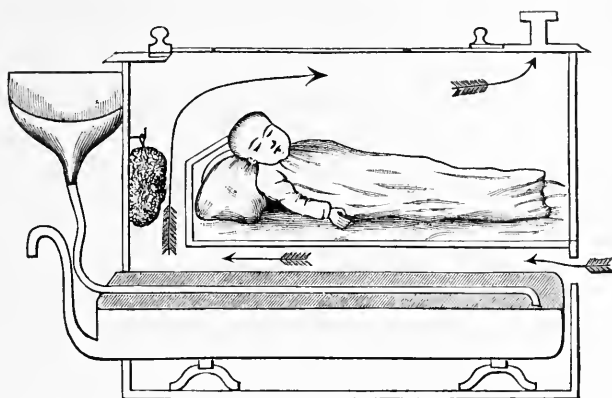


FIG. 1.—AUVARD'S COUVEUSE.
(*Indiana Medical Journal*.)

left hand being placed upon the tongue and depressing it to facilitate removal.

Brunon²⁰³_{Feb. 15} gives some sensible rules in regard to the care of

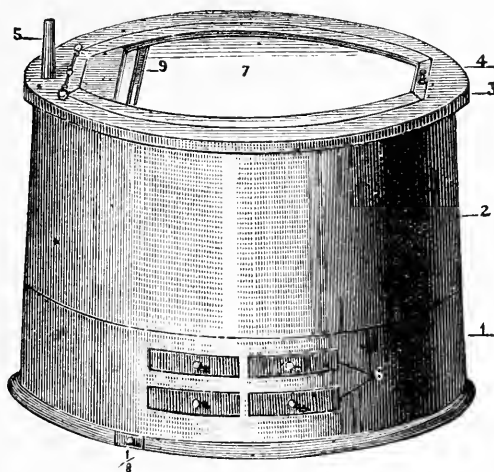


FIG. 2.—DIFFRE'S MODIFIED COUVEUSE.
(*Archives de Tocologie*.)

newborn infants after the cord has been tied with an antiseptic ligature and divided. They are as follow: 1. The infant should be thoroughly soaped to remove all sebaceous matter from the

surface of the body. 2. It should be immersed in a bath at 35° C. (95° F.). One hand of the attendant should keep the head out of water, while the other washes off the soap-suds. 3. The infant should next be wrapped in a warm and dry covering. 4. The face should be cleansed with great care, the possibility of infection upon the eyes being ever remembered. 5. When the body is quite dry, it should be powdered with a powder of starch, rice, or lycopodium.

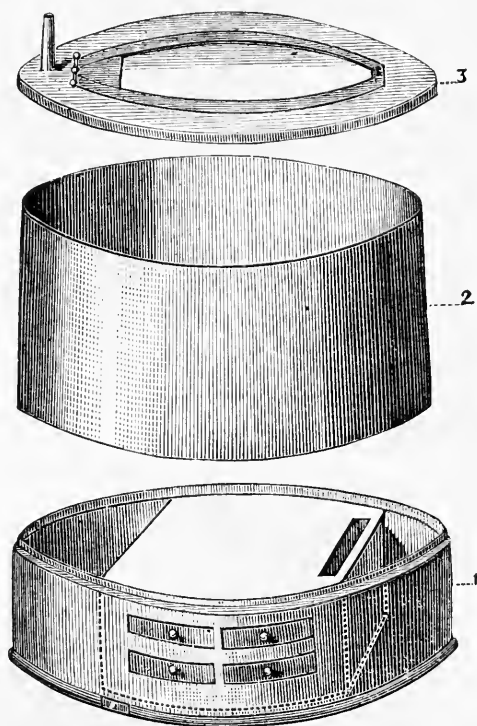


FIG. 3.—DIFFRE'S MODIFIED COUVEUSE.
(*Archives de Tocologie.*)

Whatever is used must be unirritating to the skin. Absorbent cotton is better for use in the toilet of the infant than either sponges or cloths.

The subject of rearing premature and badly-developed infants is one which has called forth some of the best efforts of Tarnier, Auvard, and others. The supplying of artificial heat and forced feeding are the two principal factors by which such a result has been rendered possible. It is but a few years since the *couveuse*

of Tarnier was devised, and it has already been modified in not a few instances. No argument is needed concerning the value of such an appliance. It is like a plank to a drowning man, and doubtless very many useful lives will be the fruit of this additional evidence of the genius of the distinguished Frenchman. A series of plates is given, showing first Auvard's modification of Tarnier's *couveuse* (Fig. 1), and

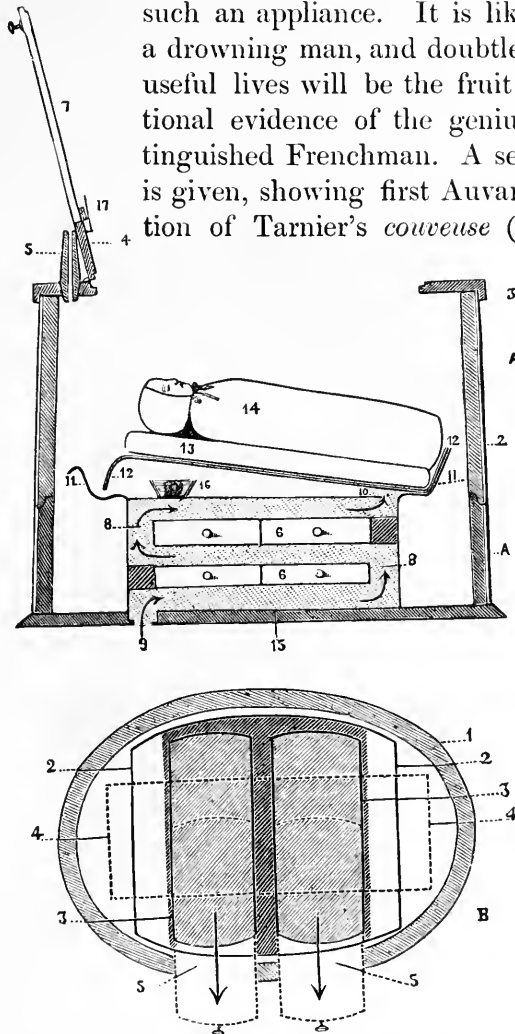


FIG. 4.—DIFFRE'S MODIFIED COUVEUSE.

A. Vertical section: 1, caisson; 2, cylinder; 3, cover, fixed portion; 4, cover, movable portion, raised and resting upon the chimney; 5, glass window; 6, chimney; 7, removable boiler; 8, air-chambers, arrows showing direction of the current; 9, entrance for cold air; 10, exit for hot air; 11, supports for the hot-water kettle, serving also as supports for the bed; 12, couch, with its two elbows; 13, mattress; 14, child; 15, hot-water receptacle; 16, basin; 17, thermometer. B. Horizontal section: 1, section of the caisson (box); 2, section of the hot-water receptacle; 3, section of the boilers; 4, lines showing the situation of the bed above the source of heat; 5, place for adjusting the movable boilers, the arrows showing the direction in which they are to be removed.

(Archives de Tocologie.)

then, in four other plates (Figs. 2, 3, 4, 5), the modification of Diffre.²³⁶ The analysis is given in Fig. 4, the numbers used being

also applicable to Figs. 2 and 3, and the advantages claimed over the Tarnier-Auvard *couvreuse* are: 1. It permits perfect disinfection, for it has neither angles nor fissures, and consists, in reality, of only one piece, the chamber in which the infant lies. 2. The cover can be manipulated with one hand. 3. The entrance of cold

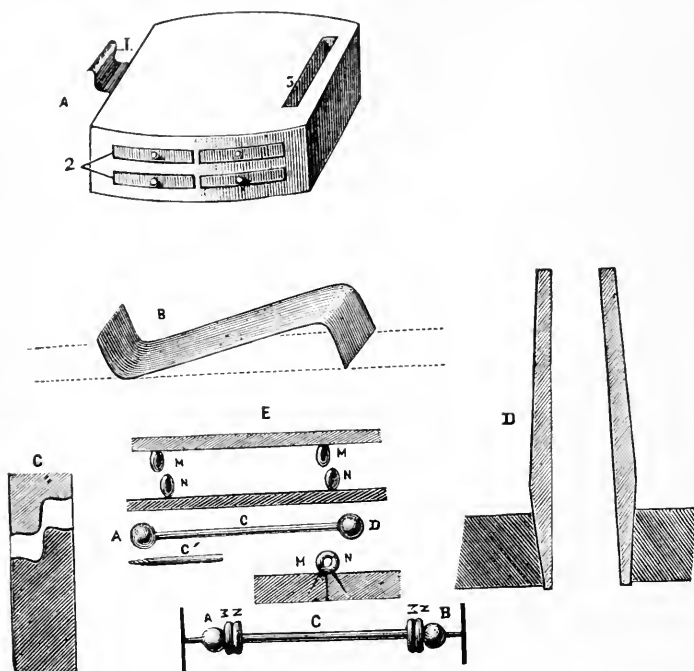


FIG. 5.—DIFFRE'S MODIFIED COUVEUSE.

A. Source of heat, as it is to be introduced into the box; 1, handle; 2, movable receptacles for hot water, which are not to be placed in position until the source of heat is adjusted in the caisson. B. Nickel-plated support, curved at both ends and forming the couch. C. Circular articulation of the cylinder with the caisson. D. Wooden chimney fixed to the cover. It is also a support for the cover when the latter is thrown back. The other figures represent the elements connected with the hinges of the movable portion of the cover.

(Archives de Tocologie.)

air is prevented; that is, there are no variations in the temperature of the interior. 4. It utilizes, to the best advantage, the heat that is generated in the instrument. 5. It keeps the child's feet warm. 6. It keeps the air for respiration in suitable condition. 7. It enables one to read easily the thermometer with which it is provided.

DIETETICS OF INFANCY AND CHILDHOOD.

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AND

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The Morphology of Human Milk.—Ivanoff⁶_{July 19} has published, in the form of a graduation thesis in the Military Medical Academy of St. Petersburg, an elaborate research on the subject of the morphology of human milk and its capacity for the nourishment of the child. The materials for the investigations were obtained in various lying-in, foundling, and other institutions. The conclusions to which his investigations led him may be stated as follows:—

The colostrum corpuscles are epithelial in character; they are more rapidly transformed into milk in the case of multiparæ than in primiparæ; the time at which they disappear depends upon the number of labors the woman has had; the more numerous these have been, the sooner do they de cease; bad general health and puerperal affections have also a considerable effect in retarding their disappearance. At the commencement of involution in the gland, after the tenth month of lactation, they re-appeared in half the subjects examined. At certain stages minute hyaline masses exist as normal constituents of the milk, some of them being free, others connected with fat-globules. As a rule, the number of fat-globules is found to be in a direct relation to their size. Healthy, young, and well-nourished wet-nurses give milk containing the largest number of fat-globules, these having a large mean size; the same, only in a less degree, is true of the cellular elements. The later portions drawn by the child are poorer in fat-globules than the earlier portions, and the globules themselves are smaller. The best guide we have as to the nutritive value of milk is the number of the fat-globules; other, though somewhat less important, signs, are the size of the globules, the number of the cellular ele-

ments, and, lastly, the number of granules. When milk contains the largest number of fat-globules it is less well borne by very young infants than that with a medium number. A large size of the fat-globules lowers the nutritive value, especially when there is a large quantity of fat, because it is not well borne. The daily increase in the child's weight generally is at its maximum,—which in these observations was 27 grammes (6 drachms 57 grains),—when the milk has a medium number of fat-globules of medium size. Milk with a small number of fat-globules of small size produces a smaller daily increase of body weight than milk with a specially large number of large-sized globules, the mean daily increase in the two classes in the observations made by the author being 16 and 19 grammes (4 drachms 7 grains and 4 drachms 53 grains), respectively. When the wet-nurse was a sickly young woman the daily increase in the infants was very small—4.5 grammes ($69\frac{3}{4}$ grains), and they frequently suffered from gastric disturbance. From the data above given, it would appear that the microscope may afford considerable assistance in determining the value and suitability of a wet-nurse's milk. Ivanoff gives a number of illustrations by himself of the various bodies found in milk, the most striking ones being of a giant colostrum cell measuring 144 millimetres, and of some amœboid change occurring in these bodies.

Wet-Nurses.—An editorial²³⁹_{July} on the “Dangers of Wet-Nurses,” says: “A point which cannot be too strongly insisted upon by the family physician is the frequent source of serious contamination of the blood of the infant from the wet-nurse. The question often arises in this country, from the frequent inability of European mothers to nurse their own infants, as to whether the *dhai*, or wet-nurse, to be employed is healthy or not; for, though by a casual inspection she may appear to be in good health, it becomes the serious duty and responsibility of the physician to answer such a question, after the most careful examination and thought. The following case illustrates the hidden and unseen danger that lurks in this domestic problem, *not* to the infant, however, but to the wet-nurse:—

“Fournier read a note, at the last meeting of the Society for the Study of Syphilis and Skin Diseases, in Paris, on the danger of suckling the infants of strangers. He thought that the risk to the

nurse of being infected with syphilis was so great that the practice should be prohibited by law. In support of his thesis, he related the following case: Whilst an interne at the Children's Hospital, he had to examine an infant of a few months old, which was affected with athrepsia without any apparent specific manifestation whatever, and was consequently confided to a wet-nurse. A few days later the infant succumbed to the athrepsia, and the necropsy revealed the existence of miliary gummata of the liver. A minute examination of the buccal cavity and of the integuments was immediately made. There was only a very slight crack on the lower lip, and two grayish spots, slightly squamous and scarcely perceptible near the right knee. The nurse of the infant was immediately isolated and kept under close observation. About twenty days afterward there appeared a fissured chancre on the nipple of the nurse, which was soon followed by secondary manifestations of syphilis.

"Here the family physician owes the unsuspecting nurse a duty not the less binding on his conscience than as when his professional verdict is given for the advantage and protection of the patient who engages his services. If an infant is brought into the world marked with the infective infirmities of its progenitors, it is criminal, with a knowledge of the risks it has power to impart, to make it the medium for the transference of disease. Even to save an infant's life, the infected mother who has the purse power to pay her own substitute for her nursling dare not face the criminal consequences and moral degradation of knowingly and willfully poisoning the blood-stream of another through the channel of her best affections in the person of her offspring."

F. Schlichter,⁸ Nos. 51, 52, '89 states that in the Foundling Asylum for Lower Austria, during a period of five and a half months, careful watch was kept over the general health, evacuations, and weight of 52 children suckled by women in whom menstruation had appeared, and 33 milk analyses were made. This work appears to have been done most carefully, and the conclusions arrived at, which we quote, deserve attention:—

"The increase of weight in children suckled by menstruating women is, in many cases, extraordinary.

"The average increase in weight is greater during and directly after the appearance of menstruation than before.

“The condition of the child during menstruation in the nurse is all that could be desired.

“During the so much dreaded menstruation, but a single child became dyspeptic; the dyspepsia, however, did not interfere with a normal gain in weight in this child.

“The milk analysis showed, on the average, less difference between the milk of a non-menstruating and a menstruating woman than between the specimens of milk taken from an individual at morning, noon, and evening.”

The paper closes with the following conclusions, which we have modified by the insertion of qualifying phrases in parentheses:—

1. Menstruation returning during lactation, after the sixth week from delivery, is not (necessarily) injurious to mother or child.

2. Metrorrhagia before the sixth week may retard the development of the child. (This is also true during later periods of lactation.)

3. Diseases in the nursing child, as dyspepsia, colic, enteric catarrh, occurring during menstruation in the nurse, should be regarded as coincidences, and, therefore,

4. Should not, *a priori*, be treated by a change of nurses (or artificial alimentation), but should be managed in the usual way (by medication and regulation of the length of the nursings and of the intervals between them). These statements are fully in accord with our opinions, based on clinical observation, that menstruation, not excessive in amount or duration, or accompanied by other pathological conditions, does not, of itself, interfere with lactation.

The Excretion of Morphine in the Milk.—Pinzani²⁴_{Mar.9} has found that when morphine is given in therapeutic doses it is not eliminated by the mammary gland as morphine, but it is in the body changed to apomorphine, and in this form is eliminated in the milk.

The writer made twelve experiments on nursing women, giving to each of them either 30 drops of laudanum or 4 grains (0.26 gramme) of morphine, distributed in divided doses through several consecutive days, $\frac{1}{2}$ grain (0.032 gramme) being given during the first day, and the dose being slightly increased after each succeeding day until the total amount was given. The milk was then collected

morning and evening and analyzed, the albuminoids being precipitated by the method of Ritthausen.

It was found that the entire amount of morphine was not so eliminated either as morphine or as apomorphine, and that in certain instances it apparently was not eliminated in any marked degree. It should be noted, however, that this latter conclusion has been contested by Fehling, Tarnier, and Chantreuil, who especially lay stress upon the danger of believing that any preparation of opium can ever be given to a nursing woman without seriously endangering the life or health of the infant; and Fehling records a case of poisoning occurring in an infant in which laudanum had been given to the nurse. Of course, this fact does not prove that in certain instances morphine may not be eliminated by the mammary gland, but that does not relieve one of responsibility and recognition of the necessity for caution in giving opiates to nursing women.

Steigenberger, of Buda-Pesth,^{622; 59}_{May 4} has recorded a case of tubercular infection through the nurse's milk. The facts of this interesting case are summarized as follows: An infant, aged 5 months, of healthy parentage, developed caseating, cervical, glandular abscesses, of a distinctly tubercular kind. Microscopical examination verified the macroscopical diagnosis. Inquiry elicited the fact that the infant had been nursed, for a period of four weeks, by a woman who had to be discharged on account of phthisis, with abundant expectoration. The etiological relationship was thus clearly established.

The infection of human beings through the milk of tuberculous animals has been repeatedly shown, and there is, of course, no reason why the human milk should not carry with it the same pathogenetic power. But, so far as we are aware, the above case is the first instance in which this method of transmission has been actually observed to occur.

The necessity of analyzing a nurse's milk when an infant wastes away without visible cause has lately been brought up by Corbeau.⁵¹_{Feb.} As a rule, when a physician is called in to see a child that is wasting away, his first idea is that the nurse's milk is not sufficient in quantity. Then he weighs the baby before and after it takes the breast, in order to be sure that it has taken a proper quantity of milk; but if the supply furnished by the nurse is sufficient, and yet the child continues to lose in weight, then the *quality*

of the milk must be incriminated, in which case no time should be lost in having a chemical analysis of it made. This will often reveal some qualitative alteration of the milk, and it will be necessary to change the nurse, no matter how great the quantity of milk she can supply.

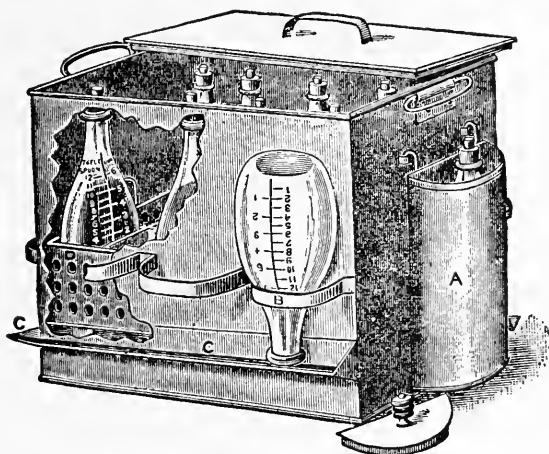
Corbeau also reports a case of this kind. A strong infant was shown to him which had lost 200 grammes (6 ounces 3 drachms 26 grains) in weight in a few days, and displayed symptoms of general weakening and quite copious vomiting. The doctor was told that the nurse was a strong woman, with a well-developed pair of mammary glands, and that she had been nursing nearly a year, but that the child had developed most satisfactorily until the previous two weeks. The doctor thought the cause might be what is called "*Old Milk*," but this expression, by its very vagueness, did not improve matters. Furthermore, the nurse protested, and called to witness the excellence of the services she had rendered. Two samples of milk were taken and sent to M. Maquart, who subjected them to a most scrupulous examination, making an analysis by four different processes, and they all gave identical results: Density, 1030 and 1035; fatty substances, normal; caseine, *only very slight traces*. The conclusion to be drawn was self-evident. The nurse was discharged and the child quickly regained its normal health with a new one.

Hand-Feeding.—Biedert³¹⁹_{Jan. 25} publishes a new method by which one may reckon the amount of nourishment necessary for a nursing child. He takes the body-weight of the child as a basis, reckoning about 200 grammes ($6\frac{2}{3}$ ounces) of cream mixtures and cows' milk dilutions to the kilo ($2\frac{1}{2}$ pounds) body-weight of the child, and by multiplying this number by the number of kilos which the child weighs one obtains the total amount of nourishment necessary for twenty-four hours. As the age increases the mixture is the more concentrated. If one will avoid using so much water, then 150 grammes (5 ounces) may be used as the number to be multiplied, instead of 200; hence, giving every kilo of child 160 cubic centimetres ($5\frac{1}{3}$ ounces) nourishment and 50 cubic centimetres ($1\frac{7}{10}$ ounces) of water less. Escherich also proposes a similar method, but it is much more complicated, and Biedert thinks that with his method he can get the same results which Escherich³⁴_{Nov. 13, 14, '89} seeks, that it is easier, and it allows an adaptation

to the individuality of the child and case which is indispensable for a rational treatment.

Sterilization.—E. P. Davis²³_{Mar.} says that as milk exists in the healthy cow's udder it is aseptic, but during milking and subsequent handling and transportation by train, or, perhaps, over rough roads in wagons, particles of manure or various foreign materials get into it and are apt to set up fermentation or other injurious changes. To deprive these accidentally introduced organic impurities of their activity, it is necessary to subject the fluid to high heat under pressure; this, simple boiling will not accomplish.

Several valuable implements have been devised for conducting



STERILIZATION OF MILK.
(*Annals of Gynecology and Pediatrics.*)

the process; one of the most simple is that made after the suggestions of Louis Starr. (See cut.)

This apparatus is made of tin, and consists of an oblong case provided with a well-fitting cover and having a movable perforated false bottom (D), which stands a short distance above the true one, and has attached a framework capable of holding ten 6-ounce graduated nursing-bottles. On the outside of the case is a row of supports (B) for holding inverted bottles while drying, and at the proper distance below these a gradually inclining gutter (C) for carrying off the drip. A movable water-bath (A) is hung to the side; in this each bottle of food may be heated at the time of administration. The bottles employed are made of transparent

flint glass, so that the slightest foulness can be detected at a glance. The graduated markings are especially convenient for measurement, and render the use of a separate measuring glass unnecessary,—a matter of no little moment, as every implement that comes in contact with the milk in sterilization must be kept chemically clean. Ten bottles are used, so that the whole supply of milk intended for a day's consumption can be prepared at once. Each bottle is provided with a perforated rubber cork, which in turn is closed by a well-fitting glass stopper.

Sterilization should be performed in the morning, as soon as possible after the milk has been served. The process should be carried out as follows:—

First, see that the ten bottles are perfectly clean and dry; pour into each 6 fluidounces (186.6 grammes) of milk; insert the perforated rubber corks, without the glass stoppers; then remove the false bottom and place the bottles in the frame; pour into the case enough water to fill it to the height of about two inches; replace the false bottom carrying the bottles, adjust the lid, and put the whole on the kitchen-range, or other heating apparatus. Allow the water to boil, and by occasionally removing the lid ascertain that the expansion that immediately precedes boiling has taken place in the milk; then firmly press the glass stoppers into the perforated corks, and thus hermetically close each bottle. After this keep the apparatus on the fire and the water boiling for twenty minutes, or even thirty minutes; the former, however, is generally sufficient. Finally, remove the false bottom with the bottles, pour out the water, replace and carry the whole, covered with the lid to the nursery.

When the hour of feeding arrives put 1 of the bottles into the attached water-bath, heat it to the proper point for administration, which, by the way, should be about 100° F. (37.8° C.). The milk may, of course, be diluted with boiled and filtered water, or receive the additions ordinarily made to adapt it to children of different ages. The tip used (a tube must never be employed) should be thoroughly cleaned and immersed for a few moments in boiling water before it is attached to the bottle.

So soon as a bottle is emptied—and if the whole of its contents be not taken, the remainder must be thrown away—it is then washed, first with scalding water, with a teaspoonful of the salicylate or bicarbonate of sodium to the pint, and placed in

the rack, which is placed around the sterilizer, to drain and dry. Milk sterilized as described will remain sound for three weeks, and even longer, if the heating is continued for thirty minutes. Sterilized milk is especially useful in traveling, when fresh milk cannot be obtained; for use in large cities during the heat of summer, when milk is most apt to undergo injurious changes; and for the feeding of children suffering with summer diarrhœa. This apparatus is not a cheap one by any means, and the poor mother can hardly afford to buy one. For a cheaper apparatus, all that is necessary is to obtain some bottles capable of containing the milk which will be consumed during the day, each bottle being large enough to hold the quantity to be used at each nursing, *i.e.*, with a capacity of from 6 to 8 ounces (180 to 240 grammes). Absolute cleanliness being an essential feature in this particular, these bottles should be thoroughly sterilized by being boiled in a solution of washing soda. They should be filled with fresh milk and a small wad of cotton placed in their mouths instead of corks. They should then be placed on a wire frame or board pierced with auger holes; this should rest on 4 blocks, in an ordinary wash-boiler, and below it there should be a layer of water. The top of the boiler being covered, heat to the boiling point should be employed for thirty minutes, when the bottles should be taken out and placed on ice. Starr has had the most gratifying results from the use of sterilized milk in private and hospital practice, and has found that it has greatly reduced the mortality during the summer months. So important is the sterilization of milk for children regarded abroad, that the Emperor of Austria has established an apparatus on a large scale for gratuitous preparation of milk for the children of the poor. It consists of a reservoir for water, communicating with a spiral or worm, into which steam passes. A sterilizing chamber above is heated by the spiral, and may also be filled with steam from this source; in this chamber are tiers of racks containing the milk in bottles. An amount sufficient for a large number of children can thus be sterilized at once.

Davis has sent out to the poor patients attending his clinic at the Philadelphia Polyclinic upward of twenty gallons of sterilized milk during the last summer, with remarkably good results.

The Sanitary Commission (Gesundheitsausschusses) of Leip-

zig⁵⁷⁵ p. 558, '89; June 157 has recommended the following method for the feeding of infants with sterilized milk:—

	COWS' MILK.		WATER.		EXTRACT OF MALT.		Capacity.	
	c.cm.	ozs.	c.cm.	ozs.			c.cm.	ozs.
In the 1st month,	350	(11 $\frac{1}{2}$)	250	(8 $\frac{1}{2}$)	3 $\frac{1}{2}$ teaspoonfuls	in 8 bottles of	75	(2 $\frac{1}{2}$)
“ 2d “	450	(15)	400	(13 $\frac{1}{2}$)	4 $\frac{1}{2}$	“ “ 7 “	128	(3 $\frac{1}{2}$)
“ 3d “	550	(18 $\frac{3}{4}$)	400	(13 $\frac{1}{2}$)	5 $\frac{1}{2}$	“ “ 7 “	136	(4 $\frac{1}{2}$)
“ 4th “	650	(22)	350	(11 $\frac{1}{2}$)	5	“ “ 7 “	143	(4 $\frac{5}{8}$)
“ 5th “	750	(25)	250	(8 $\frac{1}{2}$)	4	“ “ 6 “	166	(5 $\frac{3}{4}$)
“ 6th & 7th,	850	(28 $\frac{3}{4}$)	150	(5 $\frac{1}{10}$)	4	“ “ 6 “	166	(5 $\frac{3}{4}$)
From the 8th month on	1000	c.cm. pure milk,				“ 6 “	166	(5 $\frac{3}{4}$)

As an addition it is recommended to add a teaspoonful of Lehman's conserve.

Hübner has shown such good results in his clinic from the feeding of infants upon sterilized milk that the city magistrate has sent a circular to the druggists asking them to prepare and keep sterilized milk for sale at a moderate price. Hübner is of the opinion that the milk should be prepared with the greatest care, and will be more satisfactory if prepared by an apothecary. The sterilization of milk¹⁰¹⁸ p. 137, '89 presents certain difficulties. The heating to 110° to 120° C. (230° to 248° F.), which temperature is necessary to sterilize liquids, causes a browning of the milk. At a temperature of 100° C. (212° F.) the sterilization is not complete, the spores of bacillus subtilis resisting this temperature for six hours. The heating to 75° C. (167° F.), as is done in many of the ordinary methods, does not sterilize, for the above-named spores can withstand this temperature for several days. Even at this temperature milk-sugar caramelizes in forty-eight hours and browns the milk. The methods of Soxhlet and Engli-Sinclair do not overcome this difficulty, but they hinder the growth for a time of the micro-organisms already in the milk and prevent the ingress of others.

Freudenreich has examined milk treated with the Sinclair apparatus and then put into the incubator for twenty-four hours, and has found about four millions of bacteria in a cubic centimetre. He also found that these bacteria were almost exclusively bacillus subtilis, and that the bacterium lactis, which act so disastrously with infants, was almost entirely removed by the sterilization.

Maar⁴¹ Jan. says that sterilized milk given in dyspepsias of children is as badly borne as ordinary milk. Milk, even when sterilized, is still a material capable of decomposition, and for that reason it

favors the decomposition processes present in the diseased digestive tract. If, however, the bowel is freed from decomposing ingesta by the administration of an evacuant (calomel, for instance) and the suspension for several days of milk, sterilized milk will afterward be well borne and the dyspepsia improves.

Boiled Milk.—That the sterilization of milk, however important, is not without its disadvantages has been shown by Raudnitz and others. To determine the comparative assimilability of proteids and fats from boiled and non-boiled milk, Vasiliëff, of St. Petersburg, ¹⁰⁰⁹ No. 33, '89, Jan. 25 ⁹ has undertaken a course of most careful experiments on six healthy young men, aged from 18 to 23 years. Each experiment lasted six days, during three of which the men received raw milk and during the other three boiled milk, the daily amount of the article in either case varying between 1850 and 4200 cubic centimetres ($3\frac{7}{8}$ to 9 pints). The following are the conclusions deduced by the writer from his very instructive researches:—

1. The assimilation of nitrogenous ingredients from boiled milk is invariably less than that from the raw article. In the case of raw milk the average percentage of non-assimilated nitrogen amounts only to 7.05, the maximum to 7.62, and the minimum to 6.42; while in the case of boiled milk the respective figures are 8.18, 8.79, 7.76.

2. The same holds true with regard to the assimilation of fats. When fat is ingested in a raw state, the average percentage of non-assimilated fatty acids is 3.89, the maximum 4.85, and the minimum 2.88. In the case of boiled milk, however, the figures rise to 6.01, 6.99, and 4.53, respectively.

3. Boiling seems to affect especially the assimilation of the fats of milk, since the percentage of fatty acids in relation to the total quantity of dried feces in those fed on boiled milk is considerably larger than in those fed on non-boiled milk. In the former case, fatty acids constitute 19.03 per cent. of the total amount of dry feces; but in the latter, not more than 16.81. In other words, when a person ingests his milk boiled, every 100 grammes (3 ounces 1 drachm 43 grains) of his dry feces contain a surplus of fats amounting to 2.22 grammes ($34\frac{2}{5}$ grains).

4. Therefore, as regards its nutritiousness, boiled milk represents a decidedly inferior dietetic article, compared with raw milk.

5. As far as proteids are concerned, the difference in their assimilation may find some explanation in Schmidt's researches,¹⁰¹⁷₈₂ according to which, under the influence of boiling, cows' milk undergoes important chemical changes, nearly all the albumen and a part of the casein being transformed into hemialbumose. Schmidt's analysis proves that raw cows' milk contains 8.55 per cent. of casein, 8.4 of albumen, and 6.1 of hemialbumose. Under the influence of ten minutes' boiling, the proportion of casein sinks to 7.59 per cent., that of albumen to 0.7, while that of hemialbumose rises to 23.4.

Budde⁴¹_{Jan.} says that the sterilization of milk with Soxhlet's apparatus is, on the score of expense, not likely to be adopted by the poor. Once boiling destroys, probably, pathogenic bacteria; but Hueppe has shown that this is not sufficient to destroy the micro-organisms giving rise to putrefaction. The milk must, therefore, be boiled again immediately before it is given to the child; and, in the same way, whatever is added to the milk (water, sugar, gruel, etc.) must be sterilized. Budde recommends that the milk should be boiled in a narrow-mouthed vessel, as there is then less evaporation of water, and a skim is not formed, which deprives the milk of a certain proportion of lime and albumen.

Preparation of Cows' Milk.—Frank A. Morrison⁸²_{Dec. 28, '89} uses the following method to break up the casein of cows' milk for bottle-fed children: About 2 grains (0.13 gramme) of good scale pepsin are dissolved in a dessertspoonful of lukewarm water, and then added to about 4 ounces (124.4 grammes) of warm milk. In the course of a few minutes coagulation of the casein follows. The clotted milk is now put into a cheese-cloth bag, and the bag lightly squeezed in the hand. If the stomach is very irritable and the digestive power exceedingly bad, at first slight force is used. By this means we get, practically, whey, but with a stronger digestion more and more force is applied, until almost all the casein is forced through the meshes in rather fine particles. These are shaken up in the fluid portions and given small quantities at a time by means of an ordinary nursing-bottle. The author's experience has been that casein thus broken up does not again become blended, but exists as a flocculent rather than a tough mass, resembling in this respect human milk.

E. F. Brush⁵¹_{Aug.} read a paper on the use of commercial milk

sugar in infant feeding, before the Section on Diseases of Children, American Medical Association, Nashville, May, 21, 1890. He said that the urine and feces of infants fed on mixtures containing sugar of milk in his experience invariably contained sugar, whilst breast-fed infants did not. With the urine Fehling's test was employed, and with the feces the author macerated them in boiling water, then boiled the filtrate and refiltered, testing the final filtrate with Fehling's solution. Therefore the writer claims that milk-sugar, instead of being of value as a nutrient, must be harmful.

To find out how much sugar a given quantity of the commercial article contained, Brush bought five cents' worth of milk-sugar in every drug-store he came to, and thus collected many samples. Out of this assortment he selected five specimens, and submitted them to the tests prescribed by the United States Pharmacopœia. First, solubility. According to the pharmacopœia, milk-sugar is soluble in seven parts water at 59° F. (15° C.). Specimen No. 1, not completely soluble, after twelve hours a white precipitate surrounded by a black ring at the bottom of the tube; No. 2, slight black precipitate, enough to cause a decided opacity on agitating the solution; No. 4, solution remained slightly opaque and deposited a dark-brown precipitate; No. 5, solution perfectly clear, with a few grains of undissolved sugar at the bottom of the tube.

According to the pharmacopœia: "If one part of sugar of milk be sprinkled upon five parts of sulphuric acid contained in a flat-bottomed capsule, the acid should acquire nothing more than a greenish or reddish, but no brown nor brownish-black color within an hour." The following are the results made by Brush with this test, from portions of the specimens above referred to: No. 1, blackish brown; No. 2, dark brown; No. 3, reddish brown; No. 4, light red; No. 5, light red. The pharmacopœia also states that it is insoluble in alcohol, ether, or chloroform. He found that specimen No. 1 lost 5 grains (0.32 gramme) from 3 $\frac{3}{8}$ drachms (13.122 grammes) by repeated washing with sulphuric ether, and 11 grains (0.71 gramme) by washing with absolute alcohol. No. 3 lost $\frac{1}{2}$ grain (0.032 gramme) by washing with sulphuric ether. The writer did not test the other solution in this manner, but sent to Mr. James H. Stebbins, Jr., an analytical chemist of New York,

specimens Nos. 1 and 2 of the foregoing for analysis as to the quantity of sugar contained in each sample. He received the following reply:—

“The samples of milk-sugar sent me for analysis contain:—

No. 1,	.	.	.	.	.	.	.	94.38 per cent.
No. 2,	.	.	.	.	.	.	.	98.49 per cent.”

These are specimens bought in the open market from reputable druggists, and such as are sold to the consumers for infant feeding.

George B. Fowler⁵⁹_{July 12} has been very successful with a preparation prepared in the following manner: Put 4 tablespoonfuls of rice into 3 pints (1500 grammes) of water and boil half an hour; then set aside in back of range to simmer during the day, water being occasionally added by the attendant to maintain the original 3 pints. At night strain through a colander and place on ice. When cold a paste is formed. Three tablespoonfuls of this paste are added to each nursing-bottle (8 fluidounces—236.5 grammes) of milk and fed during the next day, a fresh supply of rice-paste being under way in the meantime. Should there be constipation, the writer uses farina, prepared in the same way and used in the same proportion. Rice is astringent, farina laxative.

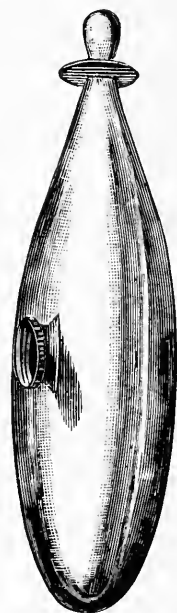
From a series of careful experiments with these pastes, the author is convinced that the hydrated starch-granules interpose themselves between the particles of casein and prevent the formation of solid curds. By this process the cow's milk is not diluted, but, on the other hand, softened, and by adding a constituent, carbohydrate, which is weak in comparison with mothers' milk. No fear may be had but that starch thus treated and administered will be digested by a child of 3 or even 2 months.

Pasture, etc.—E. W. Bogardus⁵⁹_{Aug. 2} says that in small villages, or in country districts, milk is obtained from adjacent farms, where, during the summer months, the cows are allowed to graze. This is not objectionable, provided the pasture-lot is free from noxious weeds, but the rule is that weeds are abundant, and of course the cows have free access to them. His experience and observation prove that the action of the infant's bowels is a pretty accurate indicator in this matter. As soon as the cows begin to feed on this unwholesome provender, diarrhœa will begin its depleting ravages. It has been his practice for the last five

years—whenever practicable—to see to it that the cow or cows are healthy and in good condition. Good feed, clean hay and grain, will produce good, pure milk. In the bottom of the pan into which the milk is strained a small hole should be cut and a cork inserted. After waiting a short time for the cream to rise to the surface, the cork is removed and nearly or quite one-half the contents allowed to run away, when the cork is again inserted. The remaining milk will be rich in fats and proportionately free from caseine. This, properly sweetened and diluted, furnishes a food for infants second in value to nothing, save good, wholesome mothers' milk, which is, at the present day, exceedingly difficult to obtain.

A. L. Rhea¹³⁹_{Nov.} reports, under the title of "Milk Sicknes," cases of infantile gastric and intestinal troubles which have come under his observation in the last three years, which were undoubtedly produced by the children drinking milk from cows that had been feeding on "tumble weeds." The symptoms were a mixture between cholera infantum and dysentery. The first case—a child 1 year old—recovered after a severe illness, but did not grow for over a year. The second case—a weakly infant about 5 months old—died. The first case was treated with bismuth subnitrate and blackberry brandy by the stomach, and large injections of cold well-water, as no ice was at hand.

A. E. Rockey,⁷⁷⁹_{Aug.} describes the following thoroughly aseptic nursing-bottle: "In a recent case, after confinement, where it was thought a nursing-bottle would be needed, the nurse was instructed to send for one. The grandmother of the infant, who was standing near, said, quietly: 'I have the one that Charlie used when he was a baby; perhaps that would do.' Now, as Charlie was her eldest son, and at this time mayor of the town, it was a mingling both of courtesy and curiosity that prompted the request for the bottle. This feeling, however, was immediately changed to one of great respect for the wisdom of those by-gone years when the bottle was produced. It was a most perfect and ideal instrument. A spindle-shaped flask of blown glass, with nipple and flange



NURSING-BOTTLE.
(*North American
Practitioner.*)

formed on one end and an opening an inch in diameter, with raised edge on the top, to pour in the milk. Entirely of glass. All one piece. How simple, and, yet, how perfect! What a model of asepsis!

"As trial proved in this case, the glass nipple was far superior to one of rubber, for a weak infant. Gravity could easily supply what suction could not, in getting the milk into the infant's mouth, and after he grew stronger he sucked it with great vigor. This ancient model is earnestly recommended to manufacturers for reproduction. It embodies the ideals of the present time, and will surely prove very useful and popular."

Milking by Machinery.—William Murchland, Sanitary Engineer of Kilmarnock, ^{Nov. 15} has designed a good milking-machine, in which many of the disadvantages associated with those already manufactured are avoided. It is really simple enough in its way, and is constructed on the old nipple-shield plan, in which the glass shield, with an India-rubber nipple, was moistened and placed over the breast and nipple in such a manner as to protect it entirely from pressure, but at the same time to allow of an exhaust action being brought into play by the gums and cheeks of the child.

In Murchland's apparatus the glass cup is replaced by one of iron, the child by a can for the reception of the milk and an air-pump. These are connected in series by an iron tube, which runs round the cow-house, and, if there are sufficient cans for the reception of the milk, the whole of the cows in the building may be milked at one time by the exhaust action obtained by the action of a single air-pump. There is a water-gauge by which to measure the difference in pressure between that in the pipe and that of the external atmosphere. The iron cups are moistened and placed over the teats of the cow, and the can is held in position by a hook attached to a band, which passes over the loins; short India-rubber tubes from these cups pass into the top of the can, which, when ready for use, is quite air-tight; each of these tubes has a tap from the top; there is also an India-rubber tube connected with the exhaust-pipe which runs round the building; and there is an opening controlled by a tap which communicates with the air in the cow-house. The can is first hung in position, the exhaust-pump is worked, the cups are placed in turn over the teats,

and are held in position until the tap is turned, when the greater external atmospheric pressure causes them to be pressed against the teat and the milk to flow; and as long as there is any milk left in the udder, and as long as the pressure is kept up, the flow continues.

As soon as the cow is milked dry, the tap communicating with the exhaust-tube is shut off and that communicating with the air of the cow-house is opened, the cups in the top of the can may be removed, the milk emptied out, and the can is ready for another cow. Those who describe the machine in operation say that the animals submit very quietly to this milking, and it can easily be understood how the suffering of animals affected with cracked, swollen, or ulcerated teats may be greatly diminished.

That it will insure greater cleanliness depends entirely upon the way in which the various parts of the apparatus are treated. It will be just as necessary that the teats should be carefully washed with warm water and dried with a soft towel as hitherto (though this is very rarely attended to—a little milk from the can usually being deemed sufficient for the purpose), and it would also be necessary, especially where there is any chapping or ulceration, that the iron cups should be plunged into boiling water, or that they should even be boiled for a few minutes between each operation, for, although foreign material may not get in while the first cow is being milked, what is gathered then may be washed through the pipes into the can during the next milking. We shall escape the dirt and hair that are rubbed from the cow's sides by the head of the milker, which is, after all, a very great gain and advantage from the consumer's point of view; but we should be still more satisfied, from the hygienic point of view, if, in place of being drawn from the cow-house, filtered air could be conveyed by a second tube from the outside of the building, on, let us say, the side away from the manure-heap. On most of the large farms in Denmark and Sweden cows are always carefully groomed every day, and milk is carried out from the byre as soon as it is drawn from each cow, in order that the danger arising from particles from the skin of the cow and from the air of the cow-house getting into the milk may be done away with. Hence the advantages would be even greater if the air came from the outside,

and were not sucked in somewhat rapidly, and along with it probably dust and dirt from the cow-house.

GROWTH AND AGE.

By CHARLES SEDGWICK MINOT, M.D.,

BOSTON.

Longevity.—Several new cases of an authentic character of persons living to be over 100 years have been recorded, but none of persons over 106, unless the reports that Indians in Southern California live to be considerably over 100 shall be found capable of scientific verification. Among the cases alluded to may be mentioned ^{Sept. 20} Sir Moses Montefiore, 100; Lady Smith and Miss Hastings, both 103. Some curious statistics of longevity have been published by the German government. ^{Oct. 2} It appears that in 1888 there were 91 persons in Prussia who were over 100 years old, and between 1864 and 1888 upward of 7000 persons of over 100 died; and of these 155 were more than 109 years of age.

G. M. Humphrey's ¹⁰³² work on old age has appeared, and it is not often that we find a work so full of interesting, strange, and sometimes startling results from what might have been a dry, statistical inquiry. Besides the well-known address of the author before the Medical Society of London, the work contains carefully-prepared analyses of the returns of centenarians and old people above 80 years of age, their present condition, their past life-history, maladies, and the post-mortem examination of one. There are plates also depicting the changes occurring in the femur and the jaw; and the frontispiece is of a wonderful married couple, each aged at the time 101 years. Doubtless the records will yet be extended, but the conclusions arrived at will probably not be materially affected, and the student of senile changes will be grateful to Humphrey for his labors. The profession generally, too, will welcome this useful book of reference on an important and interesting subject, for hitherto they have only had the general conclusions of surgeons and of observers of large experience, without being able to refer to the material from which those conclusions were drawn.

Growth.—Henry P. Bowditch ^{Aug. 5} read a paper at the Inter-
(N-1)

national Medical Congress on the law of growth, studied by Galton's method of percentile grades. He stated that the period of maximum growth, which occurs just before puberty, takes place earlier in children in the higher grades (the taller children) than in those of the lower grades. In the 90 percentile grade this maximum is at 14, in the 70 percentile grade at 15 years of age. This is true alike for height and weight. In girls the period of maximum growth occurs earlier than in boys, so that at a certain age girls are taller and heavier than boys. This female superiority occurs earlier in the higher percentile grades, but the superiority in height is not so great as in the lower grade. The reverse is the case as regards weight, the female superiority being more marked in the higher than in the lower grades.

At the same Congress, Axel Key, of Stockholm, ^{Aug. 16} delivered an address on the development of puberty and its relation to morbid phenomena among school-children. He reported on the measuring and weighing of school-children which have been customary for many years in Sweden and Denmark. The observations made on 15,000 boys and 3000 girls in high-schools were as follow: In the 7th and 8th years of life boys grow considerably in height and weight; after which a delay sets in, which reaches its maximum in the 10th year and lasts till the 14th year, when a considerable acceleration of growth suddenly sets in. This acceleration lasts till the end of the 17th year and is greatest in the 15th year. This acceleration is at first in height and later on in weight, in which respect it is greatest in the 16th year. The increase in weight lasts till the end of the 19th year, when the bodily development of youths seems to end. In girls the course of development is quite different. The decrease of growth after the 8th year is not so great as in boys, and yields in the 12th year to a rapid increase in height; the acceleration in the increase in weight comes later, but outstrips it in the 14th year. In the 17th and 18th years the increase in height is but slight; the increase in weight, however, sinks almost to zero only in the 20th, when growth may be regarded as ended. A remarkable thing is that boys grow faster than girls in height and weight till the 11th year, then slower till the 16th, and then faster again. With slight variations, these relations are the same all over Sweden. In Italy and the United States of America the period of puberty in girls ends at least a

year earlier. The observation of 4000 children in elementary schools in Stockholm showed that the children of the poorer classes are shorter and lighter than those of the better off. This difference seems to be less pronounced in America and in the English cities. The decrease of growth before puberty lasts longer among the poor than among the better off, but, once begun, puberty comes quickly and ends in the same year in both classes. This proves that the organism of children possesses considerable elasticity, which, suppressed by unfavorable circumstances, nevertheless asserts itself with full force and recovers all that has been lost. If, indeed, the hindering circumstances are too powerful and too long continued, a permanent inferiority may result. That increase in height takes precedence of increase in weight may be regarded as an instance of a general law, especially if one considers Wretling's and Malling-Hansen's investigations regarding the growth of children in different seasons of the year, which showed that only a slight increase of height and a still slighter increase of weight take place between November or December and March or April. From March or April till July or August a rapid increase of height takes place, accompanied by a decrease of weight. Between August and November the increase of height is small, while that of weight is great. These observations show an annual repetition of the rules discovered for the time of the development of puberty.

Sutis⁵¹_{reh.} published a little book that gives some interesting tables on the variation of weight according to the form of alimentation used. The author gives a mass of information, but the most important is concerning the increase of weight during the 1st and 2d years, taken from a large number of measurements, and, as the results are said to be very exact, we append the following tables:—

FIRST YEAR.						
Weight end of	1st month,	3 kilos	750	Increase,	750 grammes.	
"	" 2d	" 4	" 450	"	700	"
"	" 3d	" 5	" 100	"	650	"
"	" 4th	" 5	" 700	"	600	"
"	" 5th	" 6	" 250	"	550	"
"	" 6th	" 6	" 750	"	500	"
"	" 7th	" 7	" 200	"	450	"
"	" 8th	" 7	" 600	"	400	"
"	" 9th	" 8	" 000	"	400	"
"	" 10th	" 8	" 350	"	350	"
"	" 11th	" 8	" 700	"	350	"
"	" 12th	" 9	" 000	"	300	"

SECOND YEAR.

Weight end of	1st month,	9 kilos	300	Increase,	300 grammes.
"	" 2d	" 9	" 550	"	250 "
"	" 3d	" 9	" 805	"	250 "
"	" 4th	" 10	" 000	"	250 "
"	" 5th	" 10	" 300	"	250 "
"	" 6th	" 10	" 500	"	200 "
"	" 7th	" 10	" 700	"	200 "
"	" 8th	" 10	" 900	"	200 "
"	" 9th	" 11	" 100	"	200 "
"	" 10th	" 11	" 250	"	150 "
"	" 11th	" 11	" 400	"	150 "
"	" 12th	" 11	" 550	"	150 "
Weight end of 2d year, 11				"	550

Our corresponding editor, Semeleder, of Mexico,^{673 Oct.} tells us that Andrés Martínez Vargas,^{179 p. 201} of Spain, reports his observations on the growth of children, measurements, and weights. The newborn boy's average length is 0.50 metre ($19\frac{2}{3}$ inches), the newborn girl's a little less. The full-grown man's average length is 1.65 metres (5 feet 5 inches). At 3 years of age the child has reached half the size (?) of the adult; at 6 years the child has twice the length of the newborn child.

The newborn child weighs, on the average, 3 kilos ($7\frac{1}{2}$ pounds); females and children of primiparæ a little less. During the first three days of extra-uterine life the weight diminishes somewhat, and increases again from the fourth day, reaching on the seventh its original weight. The causes of this diminution are: 1. Evacuation of meconium, 60 to 100 grammes (15 to 25 drachms). 2. Evacuation of urine, 30 to 60 grammes ($7\frac{1}{2}$ to 15 drachms). 3. Exhalation of moisture from the lungs and skin and loss of fat, 55 to 60 grammes ($13\frac{3}{4}$ to 15 drachms). 4. Separation of the funis, 30 grammes ($7\frac{1}{2}$ drachms). 5. Lack of food; total loss averages 22.2 grammes (7 ounces), or one-twelfth of the total weight (of course, there are variations).

After the separation of the funis, the average daily increase is (of weight) from 20 to 30 grammes (5 to $7\frac{1}{2}$ drachms), or 175 grammes ($5\frac{1}{2}$ ounces) a week and 700 grammes (22 ounces) per month, during five months; 15 to 20 grammes ($3\frac{3}{4}$ to 5 drachms) a day, or 105 grammes ($3\frac{1}{2}$ ounces) a week, or 450 grammes (15 ounces) a month during the following seven months. A child, weighing when born 3 kilos ($7\frac{1}{2}$ pounds), or one-twentieth of the weight of an adult, weighs 6 kilos (15 pounds) at 3 months of

age and 12 kilos (30 pounds) at 12 months. At 7 years of age the weight is double that of 1 year and at 14 years double that of 7 years.

Quantity of milk the child takes every time it nurses:—

First day, 3 grammes ($\frac{3}{4}$ drachm) ten times,—30 grammes ($7\frac{1}{2}$ drachms) a day.

Second day, 15 grammes ($3\frac{1}{4}$ drachms) ten times a day,—150 grammes (4 ounces 6 drachms) a day.

Third day, 40 grammes (1 ounce 2 drachms) ten times a day,—400 grammes (12 ounces 4 drachms) a day.

Fourth day, 55 grammes (1 ounce 6 drachms) ten times a day,—550 grammes (17 ounces 5 drachms) a day.

Fifth day, 60 grammes (1 ounce 7 drachms) ten times a day,—600 grammes (19 ounces) a day.

At 5 months, 60 to 80 grammes (1 ounce 7 drachms to 2 ounces 4 drachms) ten times a day,—600 to 800 grammes (19 to 25 ounces) a day.

After 5 months of age, 100 to 130 grammes (3 ounces 1 drachm to 4 ounces) eight times a day,—800 to 1040 grammes (25 to 33 ounces) a day.

Variations are due to food, light (darkness diminishes the weight), seasons (increase from May 15th to July 15th; still more from July to November 15th; less from November 15th to May 15th). Castration has an increasing effect on the weight; the legs grow extraordinarily. Diseases: vomiting diminishes weight, diarrhœa much more so; whooping-cough not remarkably; diseases of the mother or nurse (like sore nipples, abscess of the breast, erysipelas, metritis, etc.) evidently diminish the increase in weight.

Relations between weight and size: weight has three yearly periods,—maximum from August to December, medium to end of April, and minimum from April to end of July.

Increase in length has likewise three periods: minimum from the last half of August to end of November (maximum of weight), medium from December to end of March, and maximum from March to August (minimum of weight).

The most important work of the year is that of Fried Eris-
mann,⁸ June 19, July 3 who has collected numerous statistics in regard to 115,500 laborers in 1229 manufactories in the province of Moskan.

Besides reaching many important results in regard to the effect of various occupations on the growth, physical development, and health from childhood to old age, he gives also the most extensive continuous statistics of the height and weight of men and women, beginning with the 8th year and ending with the full term of life, which have ever been published. As regards the period of childhood, he fully confirms the important discoveries of Bowditch, and finds the same fluctuations at 8 and 11 years and in the prepubertal period. The Russian laboring-man continues to grow in height after his 20th year, adding from 20 to 23 years 0.57 centimetre, and from 23 to 27 years adding 0.20 centimetre; with the 27th year the growth in height is completed. The average stature of adult males is 165.13 centimetres. At this height the man remains for about twenty-five years; about the beginning of the 6th decennium begins the senile shortening, which, however, does not amount between the 50th and 70th years to more than 2.4 millimetres, from the 70th to the 80th year to only 5.1 millimetres, and not until after the 80th year does the body shrink noticeably in height. The entire shortening reckoned from the 50th year amounts altogether only to 1.6 centimetre. The girls grow very little in height after the 17th year; from 17 to 18 years, only 4 millimetres; 18 to 20 years, 3 millimetres; and after that, at most, 1.6 millimetres. At 23 years their growth in stature stops absolutely, their height then being 153.20 centimetres, which is 11.93 centimetres less than the average man. The senile shortening begins earlier than in men, for the women lose 1.5 centimetres between 40 and 50 years, and at 60 show a minus of 2 centimetres. The measurements of weight were made on the men only, and were taken on 16,085 individuals just before the noon meal; the data given begin at the 11th year. Until puberty, the yearly increase is from 1.5 to 2.0 kilogrammes ($3\frac{3}{4}$ to 5 pounds); the increment rises at 14 or 15, and attains its maximum with the 16th or 17th year. After the 20th year the growth in weight becomes slight (200 to 300 grammes— $6\frac{1}{2}$ to $9\frac{3}{4}$ ounces), but continues at 50 to 100 grammes ($1\frac{1}{2}$ ounces to $3\frac{1}{4}$ ounces) yearly, up to 50 years. Between 50 and 60 there is a slight loss of weight, which increases thereafter. It is impossible to do justice in a single paragraph to a work extending over volumes of statistics, and which must be regarded as a monumental investigation. A more

just idea of Erismann's researches may be gathered in the notice from which this report is condensed.

L. W. Tagerlund gives the results of an elaborate investigation into the condition of the centres of ossification during the 1st year, which will be of value to forensic practitioners having occasion to determine the probable age of an infant.

Thomas Dwight ⁹⁹_{Apr.24} has studied 100 skulls of ages approximately known, and gives in tabular form his observations as to the sutures in each skull. The table shows that the sutures begin to close much earlier than has ever been stated,—in several cases in persons under 30 and in all but one case in persons of 30 to 45. The closing, as well known before, begins on the inside. The time of the closure of any particular part of a suture and the order in which the process advances are very uncertain. It thus appears that no reliable conclusions as to the exact probable age of a skull can be drawn from the condition of its sutures.

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